Mainstreaming Education for Sustainable Development in Botswana: A Case Study Research of Teacher Education Institutions

Jesse Schrage
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Scientific Abstract:
The present paper is a case study research that explores how different teacher education institutions in Botswana have worked towards the infusion of Education for Sustainable Development pedagogy and content in the curriculums of pre-service teachers. The main purpose of the research was to understand what elements promoted or inhibited the development of ESD change project by educational institutions. Combing the theory of change, the theory of human capability, the theory of social learning and the theory of transformative learning, a theory-based evaluative tool was developed and used to analysis data obtained through a variety of data sources. The results indicate that there are a number of crucial elements that enable a successful implementation of ESD in teacher education institutions in Botswana, namely: the educators’ ability to foster transformational pedagogies in the classroom, and their capacity to understand the different approaches that are inherent to the concept of ESD, their capacity to strategically plan for change and the wider institutional context for this implementation. Importantly, this research also provides some cues as to how the further implementation of ESD can be guided in teacher training.

Keywords: Education for Sustainable Development, teacher institutions, case study, assessment, Sustainable Development

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Mainstreaming Education for Sustainable Development in Botswana: a case study research of teacher education institutions

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Summary:
How can we make education more relevant in addressing the wider social and environmental issues that have emerged in the last decades? With global threats such as climate change, biodiversity loss and water scarcity on the rise, how can our learning institutions prepare learners to address these issues?

Education for Sustainable Development has, in recent decades, been advanced as an important driver of the sustainable development agenda. In a bid to make education more relevant in addressing the wider social, economic and environmental problems of our time, ESD has the ambition to equip learner with the relevant knowledge, skills, competences, and values to deal with those issues. In terms of teaching practices, a wide range of literature has identify crucial process, pedagogy and content meant to build towards a set of learning outcomes relevant for the 21st century.

This research paper is interested in understanding how Education for Sustainable Development can be fostered in teacher education institutions. Building capacity for teacher educators represents an important strategy in working towards the dispersion of ESD-related teaching practices. But how can we support teacher educators to work towards the infusion of ESD into their content and their pedagogical approaches?

As such, the study has developed an evaluative tool aimed at understanding the different elements that support or contribute to the infusion of ESD in teacher education in Botswana. Through a case study approach, data was collected were carried in six different institutions and enabled to identify the elements that promote or inhibit the implementation of projects seeking to infuse ESD in the curriculum of teacher trainers in Botswana. The results indicate that the understanding of sustainability issues on behalf of pre-service teachers is determined by the ability of the teacher educator to understand the concept of ESD and to understand what teaching processes participate to a transformation of mental models. Furthermore, support from the institution in which ESD is implemented and the ability of the educational institutions to strategically implement such a process were also crucial.

Most importantly, the framework that was developed for this study can now also be used to guide institutions that seek to further infuse ESD in their curriculum. As such, this study attempts to inform how ESD practices contribute to a change of knowledge, skills, competences and values that are needed to live sustainably.

Keywords: Education for Sustainable Development, teacher institutions, case study, assessment, Sustainable Development

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Introduction

“The volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes us into the depth of things” (Schumacher, 1974)

The latest IPCC report is yet another testimony to the way in which humanity has, in recent decades, altered the biosphere. The way in which anthropogenic emissions have unbalanced the global climatic system comes against a backdrop of global resource depletion (UNEP, 2012), increase in food prices (Arezki & Bruckner, 2011), and declining biodiversity worldwide (WWF, 2014). These trends have started to appear threatening not only to the species who we share those ecosystems with, but also to ourselves as we are slowly transgressing life-bearing planetary boundaries, away from a safe and just space for humanity (Raworth, 2012). In reaction to this context, recent decades have seen a rise in environmental concern globally. In a string of international summits, countries around the globe have gathered to address those concerns and attempted to articulate a more durable and sustainable form of development.

In this regard, Education for Sustainable Development (ESD) has in recent years received increased attention. Understood as process of learning and by extension a process of teaching, ESD enables the development of knowledge, skills, attitudes and values that work towards a transformed understanding of sustainability issues. Since the early 2000s, a large global movement of governments and educational organizations have started to investigate how to create or reorient their programs so as to enable citizens to face the challenges of the present and the future and support decision makers to make viable decisions for a better world (UNESCO, 2005). The Education for Strong Sustainability and Agency (ESSA) program is by its nature and through its work, part of this global movement. Initiated in 2011 by the Swedish International Centre of Education for Sustainable Development (SWEDESD) and the Southern African Development Community Regional Environmental Education Program (SADC REEP), ESSA aims to make teaching and learning central to strengthening the ability of communities to make sound choices for the future. Working with teacher educators in a Southern African context, the ESSA program seeks to infuse relevant content related to ESD with the overarching aim of contributing “to a teacher education that is relevant for the challenges ahead and that can contribute to the transformation of our society” (ESSA, 2014).

The present document is a case study that looks at how different teacher education institutions in Botswana have approached, embedded and implemented projects seeking to infuse ESD in the curriculums of pre-service teachers. The different cases that are considered here were all initiated after a series of workshops that were organized by the ESSA program in 2013. During those workshops, the participants were encouraged to formulate a change project that they would implement in their home institution with the overall aim of working towards the infusion of ESD in the curriculum of teacher students. However, since the 2013 workshops that sought to familiarize teacher educators to the core concept of the ESSA program there has been no in-depth review of the evolution of the different change projects once they had been implemented back in their respective home institution. Through the lenses of a theory-based evaluative framework the present study will evaluate how, after the cluster workshops of 2013, teacher educators attempted to infuse the principles of the ESSA program into their practice. In this regard, the following research questions have been outlined.
Question 1: How did the change projects contribute to a transformed understanding of sustainability issues in the education of teacher students in the Botswana institutions that attended the cluster workshops of 2013 and 2014? Did teaching practices change in this regard?

Question 2: To what extent and how have the change projects initiated by the Botswana teacher education colleges that attended the cluster workshops of 2013 and 2014, and who had for initial focus the infusion of ESD principles, achieved their objectives?

Through the above questions, the present study is interested in understanding the way in which ESD-related teaching and learning processes can be fostered so as to make education more relevant in addressing wider social, economic and environmental sustainability issues. This present study provides the opportunity to understand how ESD has been implemented in a wider institutional context where efforts are made to strengthen the infusion of ESD in teacher education. Using data extracted from a combination of interviews, focus groups, document analysis and field notes, the purpose of this research is to contribute to the development of infusion of ESD in teacher education institutions in Botswana by understanding its helping and hindering factors.

With this aim in mind, the following chapter starts by introducing the ESSA program and the wider social, economic and environmental context in which this study is taking place. Chapter 2, through a review of the current literature, examines the educational context in the Southern African Development Community and delves deeper into the different concepts of ESD that have been formulated in Southern Africa and more precisely in Botswana. In chapter 3, I introduce the theory-based evaluative framework developed for this study and explain how it seeks to answer the two research questions. Chapter 4 outlines how the case study approach used here informs the research methods that were used and the ethical dilemmas that are pertaining to this study. Chapter 5 contains an analysis of the data that were collected at the different teacher education institutions in Botswana and discusses the ways in which the infusion of ESD can be amplified in Botswana. The last chapter synthetizes the conclusions emanating from this study.
1. The context of the study

The present chapter attempts to identify the past, present, as well as social and environmental forces that have shaped and are shaping the southern African region today. To do so, it will first describe the wider context from a human development and ecological perspective. Then, it looks more precisely at how the ESSA programme works towards the infusion of ESD in the Southern African region. Finally, the chapter gives a brief introduction to the Republic of Botswana, its history, and the many contemporary issues that are pertinent to ESD in general.

1.1 The southern African human development and economic context

To address the challenges of colonial legacy, development and globalization, the Southern African Development Community (SADC) set to cooperate with the common aim to eradicate poverty through economic development and the maintenance of peace in the region. Established in 1992 and gathering 15 member states from the southern African region (Angola, Botswana, Democratic Republic of the Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe) its mission is to ensure “sustainable and equitable economic growth and socio-economic development through efficient, productive systems, deeper co-operation and integration, good governance, and durable peace and security” (SADC, 1992). As such, the SADC has been a crucial actor in shaping the socio-economic profile of the region.

Southern Africa’s progress on the different Millennium Development Goals has been rather scattered and the region is still characterized by strong vulnerability (UNDP, 2014). While the disparities within the region have been declining and some remarkable advances have been made in some areas, such as net primary school enrollment, gender parity in primary education, the representation of women in decision-making, reduction in poverty and the reduction of the spread of HIV/AIDS, many challenges still lay on the region’s path to development (UNDP, 2012; Bauer & Taylor, 2005).

In 2014, it was estimated that the population in the SADC region stood at 277 million, a 2.07 percent growth from 2013 with the largest growth experienced in Tanzania. Sixty-three percent of this population lives in rural communities and is directly or indirectly engaged in agriculture or land resource-use (Chitong, 2012). As a whole, the region is the poorest region on earth with about two-thirds of its inhabitants living under the international poverty line of US$1.25 dollars per day (World Bank 2010).

Recently, the poor economic performances have largely been attributed to the region’s high sensitivity to the development of global markets (essentially food and oil) (SADC, 2012). The GDP growth rate for the area has been reducing with Lesotho, Namibia, and Swaziland experiencing the most significant drop with a real GDP growth slow down by 2.3 and 4.1 percentage points respectively. Out of all the SADC countries, only Mozambique recorded a GDP growth above 7 per cent, the target set by the member countries to achieve poverty eradication.

Natural disasters, violent conflict, global and regional financial instability and food price volatility have created a situation of uncertainty in the region, strongly affecting people’s livelihoods (UNDP, 2014). This situation has been exacerbated by the HIV-Aids epidemic in the region. Despite a steady reduction in infections the SADC region remains one of the most affected regions in the world. According to UNAIDS’ Global Report 2010, out of the total number of people living with HIV worldwide in 2009, 34 percent resided in ten countries of the SADC region. From a human development perspective, the SADC region as a whole is faring rather poorly. The lack of access to basic amenities (water and electricity), high unemployment
rates, and a lack of improvements in educational quality have strongly contributed to this trend. The average life expectancy (2012-2014) at birth is of 55.1 years for the whole region with some strong disparity between countries: Botswana, Tanzania and Mauritius have a life expectancy at birth of 51.61 and 71 respectively. Literacy rates in the SADC region for youth and adults are 77.7 and 83 percent respectively (UNESCO 2012).

There have been some clear improvements in the last few decades in terms of economic and human development indicators. Many barriers, however remain for the SADC member countries to bring their countries towards the development path they had defined. As explained by Richards (2008, p.1): “the scale of human developmental challenges facing the majority of the SADC countries across many of the indicators remains extremely daunting”.

1.2 The Southern African environmental context

The Southern African region hosts some of the most biodiverse ecosystems on Earth (Darwall et al, 2009, Linder et al. 2010, Schmiedel & Jürgens, 2010). Unfortunately, SADC’s legacy of apartheid rule on its territory, along with recent population trends and diverging patterns of economic development have all strongly influenced the variety of land-use present in the SADC region (Chigara, 2012). Development activities, urbanization, agricultural practices and stress on natural resources have, among others, all strongly eroded the biological resources of the area and altered its ecological processes (UNEP 2013).

With more than two-thirds of its population living in rural areas, the region relies heavily on natural resources for survival. In Zimbabwe for example, forest based products such as wild foods, wood, medicinal plants, grass, reeds, honey and leaves contribute over 30 percent of average rural incomes (Bwalya, 2013). According to SADC’s Regional Biodiversity Strategy, more than half of its Gross Domestic Product is derived from primary sectors of production such as agriculture, mining, forestry and wildlife (FAO, 2010; SADC, 2012a). According to the same report, more than 40 percent of the region’s species are endemic, making thus the conservation and sustainable use of its biological resources of primary importance.

With 70 percent of the SADC population relying on groundwater, recent droughts and scarce rainfall patterns have increasingly affected those populations already at risk (FAO, WFP & IFAD, 2012; Villholt et al, 2013; SADC, 2014). With the high unpredictability and heightened vulnerability due to climate change, the overall situation is likely to severely affect peoples’ livelihoods and threaten the future capacity of the region to become food secure (Agra, 2014; Nelson, 2014) and to reduce the level of poverty (Christiaensen et al, 2011). The SADC’s commitment to sustainable environmental management is reflected in the wide range of multilateral environmental agreements signed by its member states (see SADC,2012b). Due to the trans-boundary nature of the issues at stake, further regional cooperation will be needed (UNEP, 2008; SADC, 2012). Biodiversity being a basic resource for sustainable development (UNEP, 2013), the consumption and extraction of its many products need to be carefully balanced with the human development needs identified earlier, of which the eradication of extreme poverty is importance top priority.

1.3 The ESSA program

1.3.1 The programme

Education for Strong Sustainability and Agency, or ESSA, was initiated in 2011 through a partnership between the Swedish International Centre of Education for Sustainable Development (SWEDES), SADC REEP, 42 universities and teacher education institutions in Southern Africa (see Figure 1 below) and Jönköping University in Sweden. The aim of the programme is
to support “teacher educators and their institutions to introduce innovative methods and relevant content related to education for sustainable development in their syllabuses and working practices” (ESSA, undated: 6). Hereby, the programme aims at mainstreaming the concepts of strong sustainability and agency into the curriculum of teacher education for primary and secondary school teachers in the partner institutions.

Strategically, the ESSA program takes a broad approach to infusing the notions of strong sustainability and agency in the teaching and educational practices of the member institutions. It is built on the following three reinforcing components:

- The development of a handbook on holistic teaching methods and learning content which focuses on the development of classroom practices. Entitled “The Parts and The Whole - a Holistic Approach to Environmental and Sustainability Education”, the publication combines both a teacher manual and student worksheets aimed at developing the ability of teachers to enhance the capacity of students in addressing sustainability/complex challenges.

- A focus on institutional change aimed at creating the structures and the policies to embed EE in the classroom. The programme addresses both heads of teacher education institutions (Deans, Rectors and Principals) and teacher educators with the aim of developing synchronization between policy and practice.

- An online education platform, called Fundisana Online, which provides a “learning network for teachers and teacher educators to share experiences across SADC countries” (ESSA-Online, 2015). Expecting to reach 120 000 students by 2016, the platform aims to expand the reach of the program and accelerate the dissemination of ESD-related content and methods throughout the region.

Taken together, the three elements mentioned above enable the program to approach and redefine the relevance and quality of education in Southern Africa. The strategic focus of the
A program on teacher educators is a highly relevant way in accelerating and deepening ESD. Indeed, the recent Global Action Program on ESD launched by UNESCO has identified teacher education as one of its 5 priority action areas.

1.3.2 Programme implementation
The implementation of the ESSA programme rests on a series dialogues between partner institutions aimed at integrating the knowledge and content developed by the program into the diversity of existing initiatives already occurring in the region (ibid). The strategy and timeframe of the ESSA program develops into 4 phases as displayed in Figure 2 below.

Figure 2: The ESSA Programme’s timeframe and cycles

The four phases displayed in the figure above represent the four ways in which the program acts to integrate the notions and methods of ESD into the curriculum of partner teacher education institutions. Importantly, the program does not only address the practice of teacher educators, but it seeks to impact the wider educational system of the region. Phase 2 focuses on the heads of teacher education institutions as well as representatives of Ministries of Education who are able to influence institutional and national policy making as well as curricula development and assessment. Phase 3 concerns, as we will see later, a number of workshops aimed at sensitizing teacher educators to the concept of ESD and of the ESSA program.
The present research comes in at a moment when the different projects formulated during phase 3 have been well underway. As such, this study focuses specifically on the “dialogues” that the educational institutions and the ESSA programme have been maintaining (phase 2 and 3 in Figure 2) and the way the change projects have evolved since their formulation.

1.3.3 Approach
The ESSA programme relies on the development and implementation of change projects initiated by the teacher educators in their home institution as a way to create momentum for institutional change with regard to ESD assimilation at the national level. The change projects enable participants to implement the ESSA approach in their local working place. They are a way for the participating teacher educators to develop a deeper understanding of ESD as their project is applied to respond to the local needs and the context of their home institution.

To do so, the workshops that in 2013-2014 have been formulated by and for teacher educators have been developed in the following manner:

- Activities and lectures aimed to support participants in developing an understanding of ESD and of the ESSA concepts of strong sustainability and agency including their role in implementing the ESSA programme in their institutions. Examples from the publication “The Parts and the Whole” were used.
- Time dedicated to develop ideas on how to organize and share knowledge within and between countries as a strategy for strengthening the Teacher Education Networks in southern Africa.
- Activities to support participants in developing institutional change projects.

During the workshop, four essential activities were addressed with the aim of sensitizing teacher educators to ESD: seeking relevant skills for a changing world, focus on practical experience, promotion of collaborative learning and working holistically. First a lecture introduced the concept of Education for Sustainable Development and situated the workshop in the context of a paradigm shift in teaching practice. It also introduced the concept of agency and discuss how effective pedagogy can promote it. In a second instance, the teacher educators were encouraged to practice the methods that they would applied in their home institution. Third, the workshop stressed the importance of working collaboratively to develop a deeper understanding of an issue. This learning approach is perceived as a way to widen one’s knowledge and help seeing a given challenge from different angles. Finally, the focus of the workshop was on holistic thinking. Models were used to develop a small-scale conceptual understanding of what sustainability means. Further details about those activities can be found in Annex 1.

1.3.4 The Change Projects initiated in the Republic of Botswana
The teacher educators from the different institutions and the University of Botswana participated in the cluster workshops that took place in Mbabane (Swaziland) and Victoria (Seychelles) respectively. Interestingly, the Botswana Ministry of Education and Skills Development was one of the only countries that was represented at ministerial level at the cluster workshops. This was believed to be useful for the institutionalization of ESD in the curriculum of the teacher training colleges. At the end of each 5-day workshop, the participants formulated a change project to initiate in their own institution. These are displayed in table 1.
<table>
<thead>
<tr>
<th>Institution</th>
<th>Institutional change project</th>
</tr>
</thead>
</table>
| University of Botswana (UoB) | Infusing/Mainstreaming ESD in the Primary School Curriculum  
- To cover and integrate ESD issues in all subjects in the Primary school curriculum  
- To develop infusion strategies, methods and worksheets drawing on ESSA tools and approaches specifically, The Parts and the Whole for the different Primary School subjects. |
| Molepolole College of Education (MCE) | Curriculum innovation and material development*  
- Identify topics onto which the concerned departments (Arts, English, Science, Guidance and Counseling) could infuse aspects of ESD  
- Develop activities in the 3 subjects with samples of how to infuse elements of ESD  
- Sensitize the academic Heads of Departments and Student Representative Council, with the aim to cascade to members in their departments and student under their care.  
- Encourage 10 percent of the 2nd year students population (Art, English and Science) to choose ESD related topics for their final year projects |
| Serowe College of Education | Rainwater harvesting for sustainable production  
Encourage rain water harvesting for irrigation for sustainable vegetable production; assist Primary School teachers to make school gardens functional and productive and make some initiatives to help Primary Schools work closely with the community in promoting sustainable water management practices. |
| Tonota College of Education | Water and waste management  
- To sensitize institutional community on water conservation and waste management  
- To formulate some strategies and initiatives on water and waste management |
| Francistown College of Education | Water and Waste management in the campus  
Capacitate college lecturers on issues of ESD and to further inform curriculum development, in which subject teachers systematically review courses and their content to identify areas in which concepts of sustainability can be introduced. |
| Tlokweng College of Education | To sensitize College community about issues of strong sustainability in everyday life.  
- To encourage departments to identify areas (topics) were strong sustainability can be infused  
- To initiate change project in the College.  
- To monitor and report progress of change |
| Ministry of Education and Skills Development | Provide a support system for colleges of education  
The change project will be to support all the suggested Change Projects from the 5 Colleges of Education. The Suggested Change Projects |

Table 1: Institutional change projects in Botswana developed during the 2013 cluster workshops (*: in the case of the Molepolole College of Education, the formulation of the Change project was done at a later stage, after the cluster workshop)
1.4 The Republic of Botswana

The Republic of Botswana gained its independence from Great Britain in 1966. Since its inception, the government installed a representative government that is elected through democratic rule which has provided, since then, uninterrupted political leadership to the country. Bordering Namibia, South Africa, Zimbabwe and Zambia, the country extends over 582,000 km$^2$ (See Figure 3). With a population of 2.1 million people, Botswana is one of the most thinly populated countries worldwide with a density of 3.4 inhabitants per square kilometer.

Progressive policies and strong investments geared towards social development have made the country one of the most stable economies of the African continent (Hillbom, 2012; Robinson, 2013). The economy is dominated by mining, especially diamond mining, which today accounts for about 12 per cent of its national GDP (Kegomoditswe & Tsuyoshi, 2015). With around 38 per cent of its total land area devoted to national parks, reserves and wildlife protected areas, ecotourism and wildlife watching are seen as an increasingly lucrative activity (Mbatwa & Stronza, 2010). Despite a semi-arid to arid climate, agriculture, with livestock rearing constituting more than 70 percent of agricultural GDP (BEDIA, 2012), is an important source of income and employment for the 38 percent of the population living in rural villages (World Bank, 2013).

Since the country gained its independence, government policies have directed mineral rents at developing and strengthening a system of basic needs provision for the whole country. According to the World Bank, Botswana spends more than 40 percent of its state income on social development (World Bank, 2015). Its education expenditures represent 9.5 percent of GDP, which makes the country, in comparison with countries worldwide, the 5th largest governmental investor in education globally (as ratio of GDP). Other social indicators such as infant mortality rates, life expectancy at birth, primary and secondary education and adult literacy rates all have recently registered positive trends ( Clover, 2003, UNDP, 2014).

Despite some positive social improvements and economic developments, the country has been unable to deliver a broad based development as high social and economic inequalities still persist. With a calculated GINI index of 63 percent, Botswana records a rather high rate of inequality compared to other countries in the region (African Development Bank, 2014). Other challenges include persistent poverty with 18.3 percent of the population living under the national poverty line and an unemployment rate evaluated by the government to be close to 20 percent (World Bank, 2015). Overall, the Human Development Index for the country is low compared to other countries in the region mainly due to a regressing level of life expectancy inflicted by a HIV/AIDS prevalence rate of 23.5 percent for adults between 15 and 49 years of age (UNAIDS, 2012).
The 5-year National Development Plans (NDPs) are important in guiding the development of the country. Each document outlines the governmental strategies and the overall focus that is meant to guide policy and economic investment at a national level (Government of Botswana, 2011). Started after the country’s independence in 1966, the country is now preparing for the 10th NDP whose focus, as we will see later, has been crucial for the articulation of environmental education.

From an environmental perspective, water availability and water-related issues are the most prevalent environmental issues in Botswana. Since long, drought and desertification have been plaguing the country (Darkoh, 1999) and rangeland degradation along with a reduction in the number of wildlife species have also been of concern (Wingqvist & Dahlberg, 2008). According to Guha-Sapir et al (2004), out of all the eleven natural disasters that occurred in Botswana between 1974 and 2003, seven were related to drought, three to flooding and one to windstorm disasters. Of the total number of people killed and affected (13,529), over 93 percent were affected by droughts.
2. Literature Review: ESD in Southern Africa

This present chapter wishes to give an understanding of the concept of ESD in Southern Africa. It will describe the educational context in the Southern African Development Community (SADC), the different factors that influenced it, and then look in greater detail at how ESD was formulated in Botswana.

2.1 Educational context in the SADC

The importance of education has been widely acknowledged. Understood as a fundamental human right, it enables “individual freedom and empowerment” and as such had been recognized as crucial for improving people’s lives (UNESCO, 2015a). As a strong catalyst for sustainable development, education has been recognized not only as a right by itself but also as a means to achieve other development targets such as poverty reduction, nutrition improvements, health gains, economic growth, gender equality and empowerment (UNESCO, 2014). Since 1997 SADC has affirmed the importance of education through its protocol on Education and Training. Along with the adoption of the Millennium Development Goals in 2000, the member countries have, highlighted the need to address the educational gaps present in the region. Focus has since then been brought on improving literacy levels and enrolment rates, providing basic education to all and improving the educational system in terms of access, equity, relevance, and quality (SADC, 1997). In 2012, early childhood care and education, universal primary education and adult literacy rates had all registered significant improvements since 2002 (UNESCO, 2012).

The progress made on education in the region has been tremendous, but learning outcomes are still described as “very poor” (ibid). Furthermore, the UN initiated program of Education for All has been seriously hindered in its progress due to a variety of elements such as a lack of infrastructure, of human resources and of quality teacher education (Lupele & Hotz-Sisitka, 2012). Most importantly, the spread of HIV/AIDS has been eroding the learning and teaching capacities of teachers and students alike. It has been shown to decrease the demand for education, decreasing the supply of education and decreasing the management and quality of Education (Gachuhi, 1999; Coombe, 2002). While the situation in this regard has been improving since 2000, there is still a long way to go for the SADC member states to recover from the effect of the pandemic (SADC, 2009).

Historically, there have been some important influences shaping today’s education in the SADC member state. While different in each country, the region’s past colonial education and its contemporary globalized contexts, has created what Vally and Spreen (2014) term as a “distorted value system”, which has tended to reflect international economic imperatives more than local realities. They argue that in the case of South Africa, external actors severely influenced the country’s educational policy explaining that “instead of incorporating the views of civil society and social agents, the government seemed more receptive to advice from consultants who use theories and methods found with the world of human-capital approaches and rates of return analysis” (Vally and Spreen, 2014).

2.2 Education for Sustainable Development in Southern Africa

Education for Sustainable Development (ESD) is, as we will see, an important focus for the SADC. To understand how ESD has come to be conceptualized in the SADC region, it is important to look at how the concept it focuses on, sustainable development (SD), has evolved overtime. I will therefore explore how the notion of SD has evolved internationally and how the
The concept of ESD was apprehended in the SADC.

2.2.1 International context and discourses of SD
The term sustainable development (SD) gained popularization after the release of The World Commission on Environment and Development’s (WCED) report “Our common future” (1987). This publication marked the beginning of today’s debate on the environment and development. The report was a call for politicians and policy makers to formulate strategies reaching from local to international levels to promote an economic development that would secure the “security, well-being, and very survival of the planet” (WCED, 1987: 23).

The definition of SD that the report presented has been the source of much of the criticism but also one of the most quoted sentences of the report. The WCED defined SD as a development “that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987: 8). While the concept itself was criticized for being far too vague in terms of content or implementation measures (Robinson, 2004) and even termed as an oxymoron (Frazier, 1997; Redcliff, 2006); As Hattingh (2002: 5) explains, it set the stage for “those who are concerned about the impact of human activity on the ecological basis of our existence”.

Internationally, education became part of the global SD discourse in 1992. The Earth Summit was a platform where education, among others, emerged as an essential tool for achieving sustainable development. But despite the strong ambitions and high determination of the member countries present in Rio, it appeared that 10 years later at the 2002 WSSD the goals initially agreed upon were still far from being realized. There was thus a need to rethink education. Education for Sustainable Development was born out of that need. It proposed a new way of thinking about teaching and learning and development. Combining the agenda of two of the UN’s core areas of interest - SD and quality basic education - ESD “allows every human being to acquire the knowledge, skills, attitudes and values necessary to shape a sustainable future” (UNESCO, 2015b).

The Johannesburg Summit, at the instigation of Japan, Sweden, Germany, The Netherlands and Canada, the UN decided that 2005 until 2014 would be the UN Decade for Education for Sustainable Development (UNDESD). With UNESCO as the lead agency, the aim of the Decade was: “to provide an opportunity for refining and promoting the vision of, and transition to, sustainable development – through all forms of education, public awareness and training; and to give an enhanced profile to the important role of education and learning in sustainable development” (UNESCO, 2005: 6). While it is crucial to note the importance that the Decade had for the SADC, I will now first review how the very notion of SD came to be source of much debate.

What kind of SD?
“Our common future” provided what Daly (1990) termed a “political opening” for the idea of sustainable development to evolve. SD being a normative concept, it holds a set of values that prescribes a change in living conditions. But the operationalization and the path that will lead to SD has been, since its inception, a subject of much deliberations and interpretations. Indeed, the concept has been adopted by a wide range of disciplines that have each produced their own definition. A few years after the release of the WCED report, already more than 70 definitions of the term were found in the literature (Holmberg & Sandbrook, 1992). For Neumayer (2003), this wide diversity of perceptions are based on the dualistic views that are present in the environmental ethics discourse: the weak sustainability and the strong sustainability position.
The weak sustainability position attempts to integrate the environment with economic growth. It assumes that the total amount of economic and environmental capital should remain constant and connotes that environmental change can be made as long as it increases the economic capital. This position, advanced through the work of Pearce (1995), presupposes that the environment can be evaluated in economic terms and that SD is therefore achievable through an economic growth that would take into consideration environmental costs. The proponents of this position realize the finite character of resource availability and therefore seek higher efficiency in the input/output ratios of economic processes. This position assumes a high degree of substitutability between natural and man-made capital and seeks economic growth to be maintained overtime. As such, this approach understands SD at the conjunction of the three pillars of environmental and ecological integrity, social justice and economic activity as shown in Figure 4.

In contrast, the strong sustainability position advances that environmental protection is a prerequisite of economic growth. It expresses the need to maintain and not deplete natural capital overtime. It still emphasizes the necessity of keeping a certain economic growth within ecological boundaries. Even though this paradigm rejects the substitutability capital, it still allows for a certain degree of replacement of natural capital by an economic activity that would leave the material base intact. This position therefore embeds a wide range of concepts, knowledge and views that have been recently developed by the Stockholm Resilience Centre on Planetary Boundaries (Rockström et al, 2009). The model calls for a total reorganization of societal values as it demands to place society and the economy within ecological limits. As such, strong sustainability understands SD as a bull’s eye model as outlined in the Figure 4 below.

Figure 4: The weak sustainability bull’s eye construct of sustainable development (left figure) and the 3 pillars of the strong sustainability position (right figure) (from Catto, 2009; Mann, 2009)

The above interpretations of SD are not ideologically neutral. They hold different perceptions regarding the nature of the development-environment debate and henceforth embrace certain sets of values and reject those that are incompatible with their philosophical stance. Among others, the two interpretations of SD will have diverging views on the importance of the following elements: satisfaction of basic human needs, material and economic growth, substitutability of
natural capital by human capital, environmental conservation, respect for community of life on earth, change or transformation in values and self-realization (Hattingh, 2003). Each interpretation of SD will inevitably inform a given notion of ESD (Landorf et al, 2008; Armstrong, 2011).

2.2.2 International Discourse on ESD
Education for Sustainable Development has been conceptualized differently in terms of its content and its pedagogy and in terms of the competences and skills it should provide learners in regards to Sustainable Development (Wals & Kieft, 2010; Tilbury & Mulà, 2009). In an attempt to explain this diversity, Landorf et al (2008) have argued that ESD will inevitably be the source of debates and confusion for the reason that SD itself, the role of education and the social issues it attempts to include are by nature contested. Indeed, as we seen earlier, SD is a notion that is multi-interpretable because it satisfies many different perspectives and interests and is therefore more easily adopted than a notion with a very strict definition. Furthermore, education is by no means a value-free process. Discussing the role of education, Wals & Kieft (2008) argue that the debate is about whether education should be concerned with social reproduction or about social transformation. The former assumes the learners “to accept their role within society and the workforce. They are obedient, deferential, and compliant as they take their place within hierarchical and authoritative social structures and power relationships”(2008:8). Contrasting with this view, the latter perceives the learner as an active member involved in the democratic process of the community that he or she is part of. Both positions attribute a different role to the educator and the role of learners in relation to society. Together, those elements will inform how ESD is interpreted and then implemented in different parts of the world.

In a bid to propose a model to understand the different views that are concerned with ESD, Vare & Scott (2007) outline two inter-related and complementary approaches to ESD: ESD 1 and ESD 2. ESD 1 is concerned with “raising awareness of the necessity for change and ‘signposting’ goods and services that will reduce the ecological footprint of our activities” (ibid, 193). As such, the focus of education is on guiding the learner to reduce its ecological impact; it involves a separation between the educator as expert and the learner as non-expert and receiver of knowledge. This approach assumes that positive environmental and social benefits can be obtained through a combination of incentives directed towards the learner. As such, it inherently perceives the role of education as instrumental. ESD 2 on the other hand is a complete re-framing of the role of education in regards to sustainable development. For the authors, “sustainable development doesn’t just depend on learning; it is inherently a learning process” (ibid, 194). As such, ESD 2 aims at creating capacity in the citizen to reflect on the contradiction that are inherent to SD and to go beyond the expert driven knowledge associated to ESD 1. Such reflective approach reframes learning as a form of sustainable development as the learner makes decisions in relation to its perception of the future with the aim of “improving the human condition” (ibid). Figure 5 below outlines the characteristics of both positions.
ESD 1 and ESD 2 are complementary and are thus both needed for the articulation of ESD. Indeed, while governments and organizations can favour the approach of education as seen in ESD 1 (through for example promoting sustainable lifestyle choices), bringing the understanding of education from ESD 2 will convey meaning to such approach and enable the learner to critically reflect on the long term effect of one’s choices, negotiate alternative decisions and act in an empowered and responsible way (ibid).

As we have seen, the ways ESD is understood and promoted differ. The SADC has, as we will see now, articulated a notion that is relevant to its regional and local realities while building on historical educational trends in the region.

2.2.3 ESD and EE in the SADC
In the SADC environmental education (EE) has a longer history than ESD. EE evolved out of a need to address, with education, the many environmental problems that the world was facing since the 1970s. The concept received international recognition in 1972 at the UN conference on the Human Environment that took place in Stockholm. It is a few years later, at the Tbilisi Conference in 1977, the framework, principles, and guidelines for environmental education at all levels were outlined. In 1977, while EE was already receiving attention in the region (O’Donoughue & Russo, 2004), SADC founded the SADC Regional Environmental Education Program. It is recognition of “the importance of enhancing people’s knowledge and capacity for learning as an important response to the range of complex environment and sustainable challenges facing the southern African region” (SADC REEP, 2012, p.11).

The concept of EE that has evolved in the southern African region has, for many, been perceived as similar to the notion of ESD. Indeed, in the SADC EE goes beyond the biophysical dimension and considers also, political, economic and social dimensions (O’Donoughue, 1995). Their interaction and influence with each other create the ‘environment’ that is considered in EE. This similarity became later a necessity for the work of the SADC with regard to international educational protocols. Indeed, with the announcement of the UN Decade for Education for
Sustainable Development in 2002, and in the context of other global frameworks such as the Millennium Development Goals, the SADC REEP was interested in articulating how the international context was likely to affect the practice of EE. A study termed “Positioning of southern African environmental education in a changing context” was therefore commissioned. In regard to the EE, the author explains that: “to adopt a ‘position’ is clearly an impossible task […] given that any form of ‘fixed’ position would soon be devoid of value in a rapidly changing landscape” and that it “would also be to commit ‘epistemic violence’ (authoritarian knowing)” (Lotz-Sisitka, 2004, p. 2). The report further explains that since the advent of the Rio Earth Summit in 1992, the discourse of environmental education became increasingly embedded within the ESD narrative and therefore, in their conceptions, EE and ESD overlap to a high degree.

Since then, the SADC REEP has sought to gain a deeper understanding of the concept of ESD. In order to formulate a notion of ESD relevant to local realities, the SADC REEP commissioned in 2006 a consultation process aimed at evaluating and interpreting the SADC’s position vis-à-vis of the UNDES (Lotz-Sisitka, 2006). The consultation gathered the views of 360 state and civil society organizations as well as private sector who were interested in education and training from 14 countries. The findings enabled to identify some key characteristics of the ESD landscape present in the SADC. First and foremost, the consultation process revealed the confusion surrounding SD and its many debates and how ESD is henceforth perceived. The report highlighted that since the different lines of debates that surround ESD have not been unambiguously resolved in southern Africa, the notion of ESD articulated in the SADC was therefore not clear. Furthermore, the report also highlighted the importance that different networks and partnerships play in terms of material and knowledge exchange, and how certain educational practices, especially participatory, active and learner-centered methodologies, were more prevalent than others in the SADC (Lotz-Sisitka, 2006).

At the same time, UNESCO spearheaded the creation of a Sub-Saharan strategy for ESD which provided some strategic guidelines for the development of ESD under the Decade (UNESCO, 2006). The strategy further strengthened the position of ESD in the region and promoted the “adoption of an alternative approach to education that challenges the [current] ethics and wisdom in the management of the development process by focusing on the constant search for balance between economic, socio-cultural and environmental imperatives peculiar to sub-Saharan Africa” (BREDA 2006: 9, from Paden, 2007).

Together, these have created the backbone of today’s concept of ESD in the SADC. They have enabled the SADC REEP to articulate a notion of ESD relevant to address the many issues it saw as crucial in the region and develop sustainability literacy in its population. Additionally, it has enabled, as we will see now, individual countries to articulate national ESD policies.

2.3 Educational context in Botswana

2.3.1 Historical Development

The history of education in Botswana was, in its early beginnings, a combination of missionary and colonial government-lead endeavours which developed, after 1928, into a full-fledged state control over the educational system (see Chisholm & Chilisa, 2012). After its independence, the Government of Botswana successfully developed a tightly knit system of curriculum, teacher training and examinations to reverse past educational trends and equitably distribute educational opportunities for all Batswana. A favourable economic situation, along with resort to external help and a benign history as a Protectorat enabled, argues Meyer et al (1993), a rapid development of mass education in the country. Since then, the provision of education has been
directed nationally through a range of policies that have emerged from two National Education Commissions.

The first National Education Commission was established in 1977 to answer the dire situation of the educational system at the time. As the educational systems was dramatically expanding to respond to the need of the population, it soon appeared that this development came at a cost of a steady decline in the quality of education that was delivered in the classrooms (Weeks & Mautle, 1996). The outcome of the commission, the National Policy on Education (NPE), outlined a route for the development of education in Botswana until the 1990s.

Inspired by the four national principles of democracy, development, self-reliance and unity that had been shaping national development since 1966, the document, also known as the Kagisano report, highlighted the need to provide basic education for all. To do so, the commission recommended amongst other measures, to set a compulsory basic education curriculum of 9 years, to deepen teacher qualifications and teacher training (Khan, 1997) and strengthen the link between the Ministry of Education and teachers (Chisholm & Chilisa, 2012). Crucially, while the commission perceived education as a means for individual development, the report also clearly explains that “Education must reinforce the aim of national unity” (Republic of Botswana, 1977, p.12). The government saw Education then, as a vehicle to unite and create kagisano or “making peace” (Scanlon, 2002). The challenge of tribal patriotism facing the post-independence government was strong and education was seen as a way to achieve a national identity as well as political integration within the country (Tabulawa & Pansiri, 2013).

The second Education Commission, the Revised National Policy on Education (RNPE) in 1994, built upon the recommendations of the first commission and outlined a plan, still used today, to answer and respond to new realities. While reiterating the aim of kagisano for education, it also advocates for a reform of education that is geared towards an industrial economy rather than a service-oriented or rural economy (Scanlon, 2012). The document aims to provide “a comprehensive strategy for education and training that would serve the human resource development needs of Botswana into the 21st century” (Republic of Botswana, 1994, p. 2). The report recommended, amongst others, a set of objectives to drive national education: the lengthening of the basic education curriculum to 10 years, the improvement of educational standards, focus on science and technology, extending educational opportunity to a wider number of people and a greater emphasis on examination in order to verify learning outcomes (ibid). The recommendations lead to the further development of policy documents such as the Environmental Education Guidelines (Republic of Botswana, 2002) and the Tertiary Education Policy (Republic of Botswana, 2008). Concerning the Colleges of Education, the report also stressed the importance of introducing methodologies for teacher trainees and general training in environmental education (EE). While the development of courses directed towards infusing environmental education literacy are, as argued by Mosothwane & Ndawani (2012), yet to be improved and further developed, it is undeniable that the RNPE brought the national focus on EE for the first time.

Together, the two commissions represent the framework of today’s education system in Botswana. Together, they established a gradual process of reform and adjustment of the education system in line with Botswana’s national development plans (Leburu-Sianga & Molobe 2000).

2.3.2 National and international Influences
Both nationally and internationally, many forces have shaped the notion and organisation of
education. One of the most important events is the UNESCO Education for All (EFA) conference held in Jomtien, Thailand, in 1990. There, the world community pronounced its commitments to the provision of education as a right for every human being. The outcome of the conference was a set of criteria against which the provision of education could be measured (see UNESCO 1990). The event was crucial in Botswana’s articulation of its notion of Basic Education (BE) for two reasons.

First, the concept of BE appeared to have differing notions in regards to what such programmes would entail (Brock-Utne, 1996; Chabbott, 1998). Tabulawa (2011) explains that the struggle to define the concept appeared between two differing views held by the World Bank on one side and UNESCO on the other. While the former understood BE as education that ought to focus on primary schooling in both formal and informal settings, the latter embraced “a more inclusive understanding of Education for All, which included also out-of-school youth and adults “(ibid; p. 434).

Second, at the time of the conference, Botswana itself was going through a process of implementation of the goals of its BE programmes and was therefore highly influenced by the debates that occurred at the time when the RNPE was formulating its recommendations (Thobega, 2015; Mokubung, 2000). The government of Botswana did perceive education as a vehicle for nation building and development and therefore became a signatory of the EFA principles. Later, the World Education Forum adopted the Dakar Framework for Action in a bid to renew commitment of signatory countries in achieving Education for All by 2015. Botswana has, in this regard, implemented a range of policies that have sought to work towards the objectives set by the framework (Thobega, 2015).

At a national level, education has received an important focus. In view of Botswana’s 50th Celebration of independence in 2016, the national government is currently underway to assure that the long term vision set in 1996 will be delivered (Presidential Task Group, 2011). Termed ‘Vision 2016’, the report was prepared by members of political parties, Government, non-governmental organizations, churches, youth, the private sector, labour unions and institutions and gathers the aspirations and vision of Batswana. Of primary importance is that out of the consultation process emerged seven pillars upon which development should be directed in Botswana, the first one being an “educated and informed Nation”. This document strongly helped reaffirm the direction of the government in regards to its educational policies and enabled to bring the provision of education at the center of its National Development Plan (The Republic of Botswana, 2001).

### 2.3.3 ESD and EE

Since long the Government of Botswana has recognized the importance of environmental education as illustrated in this quote from a Minster of Education in Botswana “my Ministry accepts that it has an important role in coordinating and promoting environmental education in the country” (Government of Botswana, 2002, in Ajiboye & Silo, 2008). The national government highlighted the importance of EE in the National Education Commission of 1994, where it introduced the necessity to teach and infuse its school curricula with the concept of Environmental Education (Republic of Botswana, 1994). The policy elaborated that both current teachers as well as pre-service teachers were to be introduced to EE (Ketlhoilwe, 2007), with the aim to infuse a change in attitudes and increased civic participation of the students (Republic of Botswana, 1994).

Today, the implementation of EE at a national level is being guided by the National Environmental Education Strategy and Action Plan documents (Government of Botswana, 2007;
Government of Botswana, 2014), which gave impetus for EE to be implemented nationally. The aim of EE, for the Government and the Ministry of Education, is “to develop a society that is aware of and concerned about the environment and its associated problems; a society which has the knowledge, skills, attitudes, motivation and commitment to work individually and collectively towards solving current problems and preventing new ones” (Government of Botswana, 2014: 1). Taking a broad approach, EE is seen as including both education and communication activities focusing on ecological issues, development practices and social concerns in both formal and informal contexts.

The extent to which the implementation of EE has been successful has been the subject of much scrutiny. A study by Ketlhoilwe (2003) who focused on education officers and school heads argues that EE suffered from conceptual vagueness and misconceptions. The author noticed that: “those who claimed that they were involved noted the following activities to be indicative of their involvement in environmental education: organising fairs and workshops; coordinating activities; advising teachers; and including an environmental education focus in their school inspection” (Ketlhoilwe, 2003, p.77). Furthermore, Mosothwane & Ndwapi, (2012) explain that, at the time of their study, EE was still not embedded into the teacher education programme at national level and that teachers therefore did not feel equipped to explain environmental issues to children. Nkambwe & Essilfie (2012) elaborated and showed that there is still a limited understanding of what EE means both in conceptual and practical terms for teachers in Botswana.

2.3.4 National teacher education
Today, the Ministry of Education is mandated to coordinate the 6 Colleges of Education present in the country, four of which are preparing students to become primary education teachers (Tlokweng Teachers College, Francistown Teachers College, Lobatse Teachers College and Serowe Teachers College) and two for secondary education teachers (Molepolole College of Education and Tonota College of Education). The University of Botswana also trains teachers and has, compared to other institutions, a greater autonomy and flexibility than the colleges of education (Ingvarson et al, 2013). Moreover, it assists and mentors the different teachers colleges in the country in regards to educational issues and, as we will see later, in regards to the implementation of ESD.

The colleges enable students to become teachers after a three-year program offered full-time with courses in the following areas: communication and study skills, special needs education and teaching practice with the possibility for individual specialization in certain disciplines (Ingvarson et al, 2013). At both the university and the education colleges, the students are required to apply their learning in the classroom through internships and practicum during year two and three.
3. Theoretical framework

3.1 Introduction: evaluative framework

Education for Sustainable Development is, as we have seen, a rather contested concept whose formulation and implementation can be the source of many disagreements. This is observed in the wide variety of teaching and learning processes that have been developed during the UN Decade on ESD (Buckler and Creech, 2014). As a consequence there still is not today a wide use of tools to evaluate the improvements that ESD processes bring to institutions or organizations that work towards the implementation or development of ESD. In the case of schools and educational institutions, this is even more difficult as measuring learning outcomes becomes a difficult task in regards to the broad and comprehensive concept of ESD. As the authors of the UNDESD’s final report explain: “further work is needed as to how ESD is transforming perspectives, attitudes, knowledge and choices, and preparing a new generation of citizens to live and work sustainably” (Buckler and Creech, 2014: 99).

In terms of pedagogy, there is a wide body of literature on how ESD is meant to achieve what it calls for. Tillbury (2011), commissioned by UNESCO’s and in the context of a mid-term review of the UNDESD, operated a review of the learning process that are aligned with ESD. She identified the following five processes:

- learning to ask critical questions; learning to clarify one’s own values;
- learning to envision more positive and sustainable futures;
- learning to think systemically;
- learning to respond through applied learning; and
- learning to explore the dialectic between tradition and innovation (Tilbury, 2011, p. 104)

A pedagogy of ESD should emphasize an inter-disciplinary, culturally relevant, student-centered practice based on shared and group learning for problem solving and agency (Wade and Parker, 2008). The aim of it is to lead towards what Wals & Jickling term a “transformation of mental models” (2002, 127).

In the context of the present study a theory-based evaluative framework aimed at evaluating the extent to which such learning outcomes have been achieved was developed. In regards to the research questions outlined earlier, the following four conceptual framework have been used to guide my inquiry: the theory of change, the theory of human capability, the theory of social learning and the theory of transformative learning. Their combination provide, in my view, a relevant approach to evaluate, but also guide educational institutions that want to implement ESD practices in their daily teaching. The multiple cases that are considered in this research are highly complex and their analysis, therefore, requires a frame that is sensitive to a variety of elements. Indeed, the implementation of a project meant to infuse ESD will be inhibited by e.g. individual understanding of ESD, the nature of the project itself, the context in which the project is implemented, the practices that one might infuse or even the wider administrative or institutional context. As such, the variety of theories used is way to provide a broad based approach to the evaluation of teacher education institutions, it is a way to cast a “wide net” to deal with this complexity.

The theory of change, as we will see in part 4.2, can be used for the evaluation and the assessment of multi-stakeholder initiatives aiming for long term planning. It is particularly relevant for the present study as it provides an instrument for studying how well the change
projects initiated by the ESSA programme have been implemented. Indeed, this theoretical construct helps understand the conditions and processes that lead to the formulation and implementation of a change project and explain how certain contextual drivers are likely to affect it. The theory of human capabilities can be used as a conceptual lens to look at how certain educational practices can lead towards greater agency in learners, what Tillbury called “learning to respond”. This part also provides some examples as to how this theory can be used as a guide for creating meaning and relevance in education. The theory of social learning was thought to be relevant as it is instrumental in helping educators identifying how group learning can foster the clarification of one’s own value. Finally, the theory of transformative learning goes one step further and explains how certain practices can lead towards a new understanding of complex sustainability issues. A list of those practices is provided and was used to guide the present evaluation. Together, the above theoretical frameworks constitute the frame with which I will assess the different change projects. It is the lens through which I will ‘read’ the cases in question (see Figure 6).

For the purpose of this research, the theoretical lenses will be used differentially for the various stakeholder groups. The theory of change will be exclusively used in relation to the change project coordinating team. It is a frame to understand the processes and overall context that has affected the development of the change projects. The human capability approach, the theory of social learning and transformative learning will guide the data collection with students and teachers alike and will be used as a frame to understand the content of the projects. They are appropriate lenses to evaluate the extent to which ESD learning processes have been fostered in the classroom and how they have resulted in relevant learning outcomes.

This conceptual construct will be used as an evaluative tool. Also, it can be used as a guide to plan a change in curriculum and can therefore become instrumental for institutions that wish to infuse ESD in their curriculum. The last part of this chapter outlines how the four theories relate to each other and how they have guided the data collection and analysis.

Figure 6: Assessing curriculum change projects with a theory based framework
3.2 Theory of change

The concept of ‘theory of change’ emerged from the literature on evaluation and informed social action and was devised for the evaluation of complex community initiatives. It originated with the work of Connell and Kubish (1998) which was based on the research undertaken by the Aspen Institute Roundtable Initiative (see Fulbright-Anderson et al, 1998). It proposes a framework to discuss the sequence of events that will lead to a particular outcome. These discussions then lead to the creation of a diagram and a narrative aimed to be a guiding framework, a pathway, for the stakeholders involved in the project to deliver its outcomes. According to Connell and Kubish (1998), the theory of change (or TOC) enables the improvement and accountability of an initiative by (1) creating a process where agreement is created among the stakeholders regarding the intended outcome and impact of an initiative, and; (2) by articulating among stakeholders the conditions, activities and outcomes that will support the project. This approach assists shareholders of an initiative in several ways. For the authors of the TOC, it is helpful because:

- It refines the planning and implementation of an initiative.
- It helps prioritizing questions and methods for evaluating the process and outcomes of a project or initiative.
- It encourages collaboration and capacity building for organisational learning.
- Its reflexive approach allows current aims and objectives to be questioned and for these to be changed on an informed basis.

The TOC has been applied in a variety of sectors where an evaluative framework has been needed and where theory-based evaluation is relevant (see James, 2011 for a review). The approach has been notably used by development agencies and donor organisations in the context of international development initiatives. The application of a TOC in such a context has shown to enable the elaboration of the long term vision of an organization. It helps identify the context, the beneficiaries and actors, articulate the program’s strategy and activities that stimulate the intended change, promote the articulation of policies and enable to learn from practice (Vogel, 2012a; Judge & Bauld, 2001).

More relevant to the present research, the TOC has also been applied to the assessment of educational reform in a variety of contexts. For example, in a mathematics and science program reform (Connolly & Seymour, 2009), in an articulation of early childhood and community school linkages (Geiser et al, 2013), in the assessment of district-wide and school reform initiatives (Fullan, 2006; The Institute for Research and Reform in Education, 2001), and in the evaluation of investments in education (Connell & Klem, 1996), among others.

Discussing the use of a TOC to the planning and the assessment of education reform initiatives in an urban environment, Connell and Klem (2000) argue that its use enables a successful planning of the reform and is a useful tool to drive change. They explain that the approach helps to make the reform plans more relevant and sensible to local realities, helps to build a local knowledge base and enables an evaluation that is more rigorous and timely. Importantly, it fosters the creation of a collective ownership necessary for the project to be driven forward (Fullan, 2006).

Characteristics of a TOC

Despite a wide application, the TOC approach suffers from conceptual shortcomings as the concept does not prescribe the methods used in an evaluation, or the way the theories of change are articulated and who the “owner” of a TOC are (Blamey and Mackenzie, 2007; Sullivan &
Stewart, 2006). As such, there has been a wide variety of ways in which TOCs have been formulated and implemented (Mason & Barnes, 2007). There are, however, certain points of connections and similarities between the varieties of TOC that have been developed. Vogel (2012b), for example, explains that the development of a TOC is based on the discussions between the project team members, and should focus on:

1. the **context** for the initiative, including social, political and environmental conditions, the current state of the problem the project is seeking to influence and other actors able to influence change;
2. the **long-term change** that the initiative seeks to support and for whose ultimate benefit;
3. the **sequence of events** anticipated (or required) to lead to the desired long-term outcome;
4. the **assumptions** about how these changes might happen, and about contextual conditions that may affect whether the activities and outputs are appropriate for influencing the desired changes in this context;
5. a **diagram and narrative summary** that represents the sequence and captures the discussion (Vogel, 2012b: 2, emphasis preserved)

In a first step, the frame outlined above starts with an analysis of the context (a baseline of the situation), the issue(s) needing to be addressed and an identification of the drivers (actors, networks, stakeholders) that are or can become involved in the project. This important first step justifies the need for the TOC to be developed and enables to identify the landscape within which the stakeholders will be navigating (Sullivan and Stewart, 2006). Building on the realities of the context identified previously, the following step is for the project team to develop a statement of the long term desired change that the initiative seeks to accomplish. This, Vogel (2012b) argues, is “intended to provide conceptual clarity about the realistic long-term impact to guide the project team”, and helps to articulate how the baseline situation will be changed. Third, with the long term vision in mind, the project team will express the change process as a series of events and identify the different short and medium-term changes needed. This will allow to determine how shifts in knowledge, attitude and skills will lead to the intended **change in practices or policies** (ibid). In this exercise, it is crucial to identify the outcome indicators that the TOC will be measured against as well as the target actors and a timeline of how the shift is estimated to occur (Judge & Bauld, 2001). Fourth, and maybe most importantly, the project team needs to make the assumptions of the project explicit. Assumptions, in the present context, are understood as “the values, beliefs, norms and ideological perspectives, both personal and professional, that inform the interpretations that teams and stakeholders bring to bear on a programme.” (Vogel, 2012a:26). Due to their nature, making assumptions explicit represent a difficult exercise. Their testing and deliberation is, however, needed and can improve the way the TOC is articulated (Gambone et al, 2001). Finally, the outline of a diagram and narrative summary by the project team will enable to capture in visual form the agreed steps that ought to be taken in order to deliver the intended outcome. Its creation has been perceived as useful as it permits to understand the theory of the projects’ theory of change. The structure of such TOC is displayed in Figure 7.

**Capacity development for change project implementation**
The strength of an individual or a group to implement a long-term project will depend on its capacity to respond to and use emerging knowledge. In regards to outlining a theory of change for a given initiative, the development of capacity within organizations or group of individuals
will allow them to better understand and respond to an issue (Vogel, 2012b). In the context of the present study, capacity development relates to the capacity of the change project team or coordinator to successfully put into practice the wider vision set by the ESSA programme. Understood as the “abilities, skills, understandings, attitudes, values, relationships, behaviours, motivations, resources and conditions that enable individuals, organizations, networks/sectors and broader social systems to carry out functions and achieve their development objectives over time” (CIDA, 2000), the development of capacity for teacher educators should aim at strengthening their professional capacity in terms of: (1) developing and articulating a change project in their respective institutions, and; (2) developing their understanding of the concept of ESD and its application in terms of in-class practices. This notion relates to the first layer of contextual drivers as shown in figure 7.

Perceived as an iterative process, this TOC approach enables to identify the apparent “theory” of an initiative, or what the different stakeholders understand as the necessary steps required to deliver the desired outcome. (Vogel, 2012a). Furthermore, as consensus is built and responsibilities are shared among the stakeholders involved in the program, Blamey & Mackenzie (2007) explain that the approach empowers stakeholders: planning together helps to solve the problem of role allocation that often plague the development of such initiatives.

This conceptual approach to project planning and delivery was thought to be most relevant to evaluate the extent to which the Botswana education colleges have formulated their respective change projects and then implemented it. It offers a tool to determine what elements of the strategy are lacking or where the focus of the different change project teams should be to deliver the intended outcome. Importantly, since the change projects were never conceived or formulated...
with a TOC in mind, the extent to which they will reflect elements of a TOC will be by chance rather than by design. The data will therefore help identify the most important elements for project implementation seeking to infuse ESD in Botswana.

3.3 Theory of human capability
Arguing that Education for Sustainable Development concerns a definition that is too vague and lacks implementational strength, Landorf et al (2008) proposes to use the human capability approach as developed by Sen as the basis for gaining a clearer and more meaningful understanding of ESD.

By bringing human capability back into the center of his argumentation, Sen’s (1995) theory of well-being relates to the capability of a person to achieve a combination of what he terms “functionings”. Understood as “the evaluation of the quality of life to the assessment of the capability to function” (Sen, 1989: 43), Sen’s approach takes as central focus the notions of functionings and capabilities for his conceptualization of well-being. While functioning relates to the achievements, or the choices, that one individual makes in order to improve his/her living conditions (e.g. being adequately nourished, being able to travel, being able to take part in the life of the community, or being able to speak in public without shame), one’s capability relate to the ability to achieve functionings and as thus relates to notions of freedom and the opportunities that one might have to lead the life that they desire (Sen, 1989; Saito, 2003; Unterhalter, 2009). Well-being, for Sen, is an ongoing process and focuses on the ability of individuals to make choices. In this view, poverty, for example, would be characterized not only as suffering from a lack of income, but also as a lack of capabilities. Being a non-normative concept, its conceptualization inherently incorporates notion of equity and represents thus a move away from the traditional understanding of utility rooted in materialistic notions (Alkire, 2005a; Lanzi, 2007). For Sen, another element within the capability approach that needs to come into consideration is the notion of individual agency.  Agency, for Sen, relates to the ability of an individual to pursue the goals that one values. As such, an agent is “someone who acts and bring about change, and whose achievements can be judged in terms of [the individual’s] own values and objectives” (Sen, 2001: 19). The notion of agency is crucial in relation to capabilities and functionings in the sense that it frames one’s actions beyond self-promotion and personal well-being and incorporates the concerns of others. Interestingly, when considering a group of agents, agency may promote the good for one’s community or for the environment but according Alkire and Deneulin (2009) there is also the suggestion “that development processes should foster participation, public debates and democratic practice”.

Together, for Sen the three elements outlined above are the basis of the capability approach. Within this approach, institutions and other types of social arrangements should aim at enabling individuals to develop their capabilities and increase their freedom to support and realize what they value (Alkire, 2005b).

The theory of human capability, when applied to education and well-being provides some solid theoretical grounds for the articulation and implementation of ESD. Saito (2003), while exploring the relation between education and the capability approach, argues that Sen’s work has enabled to highlight the importance of the intrinsic and extrinsic values in education. By broadening human capabilities and accumulating social capital, Saito argues that education extends human capacities (e.g. reading and communicating) which at the same time influence wider intrinsic and instrumental values (enhance people’s well-being, freedom, and capacity to create social change) (ibid). Therefore education should be seen as providing foundational capabilities that help
broadening individual freedoms. Developing this thought further Hoffman (2006), explains that education, if aimed at increasing human capabilities, should do so in an equitable and relevant way. As such, education’s traditional learning outcomes should focus not only on reading and writing skills but should focus specifically on the further enhancement of capabilities, what she refers to as “life skills”. Grounded in the work of Delors et al. (1996) for UNESCO, she explains that life skills include the learning outcomes of learning to know (use of knowledge), learning to be (self-awareness and self-esteem) and learning to live together (interpersonal and collective skills). In association with practical skills (learning to do), she explains that life skills provide an articulation of education that is relevant to achieve sustainable development. This approach provides a real change in the way that education is perceived. “Education, explains (Hoffman & Bory-Adams, 2005:4) needs to focus on sharing knowledge, attitudes, values and skills throughout a lifetime of learning in such a way that it encourages sustainable livelihoods and supports citizens to live sustainable lives”.

Towards education for sustainable human development

Based on the notion that ESD should integrate the concepts of functionings, capabilities and agency outlined earlier, Landorf et al (2008) offer a framework which enable a greater educational applicability in terms of assessment, teaching practices, curricula and knowledge and skills acquisition. By reframing ESD as Education for Sustainable Human Development, the authors bring the focus of education towards an enhancement of well-being based on the practice of democratic dialogue and a form of learning that includes local cultural and social realities. In practical terms, the educator is responsible for evaluating the contextual circumstances that will impact the student’s ability for well-being and provide a form of teaching that enables the student to understand their own capabilities. It requires him/her to be finely tuned to the student’s needs and create a space for the students to understand and become who they are. In the classroom, this is fostered by building individual agency through democratic dialogue between the different stakeholders. The deliberation between the teacher and the students enables “to identify basic capabilities and culturally valued functionings in the communities in which they practice” (Landorf, 2008, 232).

The authors discuss how the human capability approach can provide comprehensive suggestions as to how pedagogy, curriculum and assessment can be shaped:

- Pedagogy, for sustainable human development, is centered on democratic dialogue. The educator has the duty of facilitating a democratic dialogue where all learners with the aim of making them understand its significance: “that freedom of choice has value in and of itself, regardless of results” (Ibid, 233).
- Curriculum, for sustainable human development, proposes to move further than environmental education to focus on “locally determined basic capabilities”. The educator’s role is to guarantee that the curriculum is built through a process of democratic dialogue where learners and community stakeholders “address what students must know and [are] able to do to achieve valued functionings” (Ibid, 232)
- Assessment, for sustainable human development, is closely associated with democratic dialogue. “From the beginning of the year, explain the authors, the educator and students should together assess the students’ capabilities, and what they must know and learn in order to achieve locally valued functionings[…]. Assessment in this new paradigm is a recursive process, in which continuous monitoring of progress towards mutually agreed
upon capabilities becomes an intrinsic element for both the educator and her students.” (Ibid, 233)

Table 2 outlines how ESD, the human capability approach and Education for Sustainable Human Development relate to each other.

<table>
<thead>
<tr>
<th>ESD provides skills for:</th>
<th>Sustainable human development requires:</th>
<th>The Capability Approach covers:</th>
<th>Education for Sustainable Human Development covers it through:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning to know</strong></td>
<td>Recognition of the challenge</td>
<td>Reasoning</td>
<td>Relevant pedagogy: towards locally determined capabilities</td>
</tr>
<tr>
<td><strong>Learning to be</strong></td>
<td>The indivisibility of human dignity</td>
<td>Agency</td>
<td>Pedagogy based on democratic dialogue, and self-agency</td>
</tr>
<tr>
<td><strong>Learning to live together</strong></td>
<td>Collective responsibility and constructive partnership</td>
<td>Potential through social capital</td>
<td>Build consensus on democratic discussion of values, goals and priorities</td>
</tr>
<tr>
<td><strong>Learning to do</strong></td>
<td>Acting with determination</td>
<td>Basic capability or Achieved functionings</td>
<td>Learning about oneself and identifying personal preferences</td>
</tr>
</tbody>
</table>

Table 2: The capability approach (Adapted from Hoffman, 2006 & Landorf et al, 2008)

Crucially, the above theoretical framework is meant to guide the study in two ways: (a) it offers a guide to look at how the different teachers that have been involved with the change projects bring ESD in their classrooms and how ESD helps focusing on the pedagogy, and (b) it provides a tool for understanding what learning outcomes are to be expected in learners who are exposed to ESD pedagogies. Its strength lies in its ability to link relevant pedagogy with agency in learners, which is a crucial element of the ESSA programme and a core element of ESD.

3.4 Theory of social learning
The theory of social learning initially emerged with the work of Bandura (1977), who conceptualized social learning as a phenomenon occurring at the individual level within a social, interpersonal context. More specifically, the author argued that the process of learning is a cognitive process that happens through observing and imitating role models in a social context where behaviors are influenced by social norms. This theoretical construct seems, however, to be insufficient in capturing the wider setting. It did not explain the interaction between the individual and the wider social context in which this individual is situated (Reed et al, 2010).

More recently, developments within the area of learning theory (grounded in the literature on education and psychology) and social-ecological management and governance (grounded in the literature on organizational learning and collective governance) (Rodela, 2013; Cundill et al,
have sought to further conceptualize the model and further articulate the understanding of social learning. Social Learning can be understood as a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks” (Reed et al, 2010: r1). As such, while uncertainty and a lack of clarity are still plaguing the concept itself (Wals and Van der Lei, 2007), there has been a wide utilization of the concept of social learning in a variety of fields (see Glasser, 2007). The field of natural resource management especially has seen a wide application of the theory of social learning (see Muro & Jeffrey, 2008 and Rodela et al, 2012 for a review). It has been applied to the co-management of national parks, protected areas, water-based resources, and fisheries, among others (Schusler, Decker & Pfeffer, 2003; Armitage et al, 2009).

The field of environmental education has also brought an increased interest in the theory of social learning in order to understand how interactions within a group in a wider social environment can create new forms of understanding (see Lotz-Sisitka, Mukute & Belay, 2012 for a review). Understood as a form of participatory approach, the rationale behind social learning as supporting different forms of social change is grounded in the idea that it enables a shift in understanding among the participants of a given process and that the learnings from that group subsequently informs the wider community (Lotz-Sisitka 2008, 2009, 2010; Cundill, et al, 2014). In this regard, reflexivity and participation have been identified as crucial processes in informing social learning (Sillo, 2011, Masara, 2010). However, it is important to note that the perception and interpretation of “participatory” can differ from country to country and within countries as well, as illustrated by Lupele & Lotz-Sistka (2012) for Southern Africa.

In an attempt to identify how ESD learning processes contribute to educational relevance, Lupele & Lotz-Sistka (2012: 29) explain that "the use of participatory approaches in ESD […] contribute[s] to capacity building and ownership of ESD initiatives[…]. [Those approaches] also encourage the use of methods which ensure effective implementation of ESD programmes and objectives; and contribute to changes in educational practices, such as group work, research projects, experiential learning, presentations or theatre”.

It is crucial to differentiate between two forms of social learning. “Social learning as a concept, explains Reed et al (2010; r1), is frequently confused with the conditions or methods necessary to facilitate social learning”. According to the authors, it is important to note that participation does not equate per se to social learning and social change, and that while social change might occur as a result of participation, the latter is, however, not a prerequisite for the former. In the context of this study, I will use the theory of social learning in two ways: (a) as a tool to understand if and how teachers foster social learning in the classroom, and (b) if this has resulted in an increased participation, reflexivity and subsequent shift in understanding by the students.

The practices used by educators are important for learning. Equally the learning environment and the context in which learning takes place are, as we will see now, also crucial for social learning.

**Learning as a connection**
Social learning, as understood by Wals & van der Leij (2007: 18), refers to a learning “that takes place when divergent interests, norms, values and constructions of reality meet in an environment that is conducive to learning”. What is referred to here as “conducive” is the willingness of participants to engage in a discussion, or what one might refer to as the social cohesion of the group. The assumption is that in a group of learners there are different mind-sets, and that those different mind-sets provide a heterogeneity that helps the learners mirror their own positions and
mind-sets with others in the group. Therefore, Wals (2007) stresses how a carefully balanced collaborative setting enables what he terms the “deconstruction” (or de-framing) of individual assumptions and ideas which are then further challenged and assimilated together with other ideas in a process of co-creation. He argues that this is necessary for the development of a reflexive process and subsequent learning. In this way, the emergence of reflexivity relies on a balanced participation where dissonance and the direct learning context are carefully managed (Wals, et al, 2009; Kulundu, 2012).

Wals (2007) proposes that social learning is built on a process that is characterized by “sequential moments”. They are:

- Orientation and exploration – identifying key actors and, with them, key issues of concern or key challenges to address in a way that connects with their own prior experiences and background, thereby increasing their motivation and sense of purpose.
- (Self)awareness raising – eliciting one’s own frames relevant to the issues or challenges identified
- Deframing or deconstructing – articulating and challenging one’s own and each other’s frames through a process of clarification and exposure to conflicting or alternative frames.
- Co-creating – joint (re)constructing of ideas, prompted by the discomfort with one’s own deconstructed frames and inspired by alternative ideas provided by others
- Applying/experimenting – translating emergent ideas into collaborative actions based on the newly co-created frames, and testing them in an attempt to meet the challenges identified
- Reviewing – assessing the degree to which the self-determined issues or challenges have been addressed, but also a review of the changes that have occurred in the way the issues/challenges were originally framed, through a reflective and evaluative process (Wals, 2007: 41).

In daily reality, social learning, being a reflexive process, will not be displayed in the linear fashion outlined above. This is best described by Wals et al (2009) who outline a framework for social learning as represented in figure 8.
3.5 Theory of transformative learning

The theory of transformative learning (TL) has emerged through the work of Mezirow (1978) on adult education. It refers to a shift or transformation of “our taken-for-granted frames of reference (meaning perspectives, habits of mind, mind-sets) to make them more inclusive” (Mezirow, 2000:7). The author explains that as adult learners develop over time a tendency towards rejecting ideas that are incompatible with their existing frames of reference, transformative learning enables, through particular learning settings, to “move toward[s] a frame of reference that is more inclusive, discriminating, self-reflective and integrative of experience” (Mezirow, 1997:5). While creating a transformed understanding of a specific issue occurs at an individual level, its emergence will be facilitated, as is the case in the theory of social learning, within a social and interpersonal context.

Since its early development the theory of transformative learning has been criticized for its shortcomings in regards to the nature of the transformation itself. But alternative perspectives have not been able to fully replace the initial framework developed by Mezirow (Taylor, 2008; Kokkos, 2012) and have not deterred its use. Indeed, with a focus on adult learning, the theory of transformative learning has been applied to a wide variety of areas such as community development and workplace education (Mezirow & Taylor, 2011), natural resource management (Diduck et al, 2012), volunteer tourism (Coghlan & Gooch, 2011), and also creative writing (Hunt, 2013).

The field of education, and especially teaching and learning in the context of sustainability, has brought considerable attention to TL. With its emphasis on learning processes and outcomes, this theoretical framework has enabled a re-framing of the role of education in relation to
sustainability. Indeed, as argued by the work of Wals (2010) and Sterling (2005, 2011), the pluralistic society we live in, being characterized by a wide range of values, interests and actors, along with the complex nature of sustainability issues required a way of learning that address divergent interests. Described as a pluralism of thoughts, TL places emphasis on a critical, problem-based and reflective practice of education (Thomas, 2009). TL enables an “[e]ducation that fosters critically reflective thought, imaginative problem solving. The discourse is learner-centered based, participatory, and interactive. It involves, group deliberation and group problem solving” (Mezirow, 2000: 10). For the theory of transformative learning, sustainability is not a vision that education should strive for, but, similarly to the notion of ESD 2 outlined in 3.2.2, it becomes the state that emerges through transformative learning processes (Wals & Jickling, 2002; Wals & Corcoran, 2006). Transformative learning in the context of sustainability is thus a form of learning that enables alternative and new kinds of thinking and solutions that are “co-created [and] co-owned by more reflexive citizens, living in a more reflexive and resilient society” (Wals, 2007: 42).

Wals and Corcoran (2007) identified an extensive list of principles that, if integrated in higher-education settings, can foster autonomous thinking and an inclination for systemic change on behalf of both the students and the educators. These are listed in Table 3. The present study is trying to determine whether and how these principles manifest themselves in the change projects at the different teacher education institutions.

It should be noted that the two theories of transformative and social learning focus on the processes that facilitate a collaborative reflection of the learners involved. The two frameworks differ is the way in which this deconstruction is brought about. In the case of social learning theory, deconstruction is perceived as the first step towards a process of group co-creation and reflexive thought.

<table>
<thead>
<tr>
<th>Principles</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Total Immersion</td>
<td>Fostering a direct experience with a real-world phenomenon</td>
<td>Observing and monitoring sustainability impacts. Managing a specific issue.</td>
</tr>
<tr>
<td>2. Diversity in Learning styles</td>
<td>Being sensitive to the variety of learning styles, and preferences that can be found in a single group</td>
<td>Offering a variety of didactic approaches. Reflecting on the learning processes with the learner.</td>
</tr>
<tr>
<td>3. Active Participation</td>
<td>Developing discourse and ownership by utilising learners’ knowledge and ideas</td>
<td>Soliciting the learner’s own ideas, conceptions and feelings. Consulting learners on the content of the learning process.</td>
</tr>
<tr>
<td>4. The value of Valuing</td>
<td>Exposing the learners to alternative ways of knowing and valuing through self-confrontation</td>
<td>Giving learners opportunities to express their own values. Creating a safe and open learning environment.</td>
</tr>
<tr>
<td>5. Balancing the far and near</td>
<td>Developing empowerment by showing that remote issues have local expressions which one can influence</td>
<td>Relating issues of biodiversity or sustainability to last night’s dinner. Showing examples of groups</td>
</tr>
</tbody>
</table>
Social learning occurs at an individual level and is fostered by group processes where multiple interest and stakeholders are involved (Siebenhüner, 2004). In the case of the theory of transformative learning, the process of frame deconstruction is assumed to occur, but not be limited to, group deliberation and social interactions. It is therefore important to note that not all participatory learning processes result in a transformed understanding of an issue. In some occasions, the transformed understanding that occurs, within the context of sustainability, and through group processes, has been qualified as “transformative social learning” (Wals, 2010). Essentially, this refers to the notion that a pluralistic and heterogeneous group will enable new ways of approaching a problem as the diversity will help with “switching back and forth” between different mind-sets and understandings of an issue. This enables a new understanding of the issue at hand. It is crucial to note that for both the theory of social learning and the theory of transformative learning, the social context within which such process is occurring influences its outcomes.

### 3.6 Discussion on the evaluative framework

The four theoretical frameworks outlined above constitute the current framework with which I will perform the present study. This “evaluative” approach enables to qualitatively assess the extent to which the different change projects, initiated by ESSA, have been successfully implemented, both in terms of project implementation and of ESD learning outcomes. ESD advocates for a type of learning that equips learners to be able to navigate in increasingly uncertain situations, to connect with real life challenges and is empowering, reflexive and critical (Lupele & Lotz-Sistka, 2012). ESD-related learning processes enable the development of relevant knowledge, skills and competences to connect and deal with life’s challenges.

In this regard, the different theories that create the considered theoretical construct are, in their relation to one another, providing a strong frame to look at the considered subjects. First and foremost, the theory of change enables to identify the different elements that facilitate the implementation of an initiative or project. In the present case, it will help me identify what have been the limiting or helping factors that have led the change projects to their current state, such as assumptions of the stakeholders involved, dissonances in understanding of different concepts and the wider context in which the change project is being developed. The theories of human
capability and social learning enable me to identify how teacher students and teacher educators’ values are formulated in a wider social context. It also provides a frame to understand how dialogue between learners can make learning and teaching more culturally relevant and democratic. The human capability approach and the theory of transformative learning address the notion of agency, or action-oriented learning. Together, this framework enables me to observe how the way in which the different change projects were thought through will affect the way the teaching and learning practices were affected in the considered institutions. Figure 9 below demonstrates how the present evaluative approach, and the different themes it addresses, will help answering this paper’s research questions.

Figure 9: Assessing curriculum change projects with an “evaluative” framework
4. Research approach

The current chapter will identify the tools used to gather data for answering the research questions. I first explain the use of the case study approach as overarching method. After describing how it contributes to a form of inquiry relevant to the present study, I outline the different data collection techniques: interviews, focus groups and document analysis and field notes. I then discuss the ethical issues that are associated with the use of the research tools. Finally, I discuss how the theoretical framework, in association with the methods used, has created some limitations in regards to its use.

4.1 Position of the researcher

In a qualitative research process, the position and approach taken by the researcher will, along with the tools used during the data collection, be crucial in the way the research question will be answered. This present paragraph will discuss how I have approached the data and which epistemic position I have taken throughout this study.

In order to understand the pluralistic and multidimensional nature of ESD, it was thought that a social constructivist approach would be most suited to analysis and discuss the gathered data. Social constructivism posits that one’s learning process emerges from the construction of knowledge from one’s cultural and contextual reality (Andrews, 2012). As such, the way in which one will make sense of the world, and construct knowledge about and for it, will be dependent on the way the notions of reality, knowledge and learning are understood (Beaumie, 2001). “Constructivism, explains Andrews (2012: 1), proposes that each individual mentally constructs the world of experience through cognitive processes”. Knowledge, for social constructivists, is therefore constructed and not “discovered”.

In the context of the present study, this implies that such approach enables the researcher to understand and make sense of the way in which ESD is being practiced and how it relates to the context in which it is understood. The social constructivist approach, as a research position, enables to capture the multi-dimensional nature of ESD and justifies the way in which this present research uses observations of the phenomenon under study as a reflection of the world.

4.2 The case study approach

The case study approach is one of the most common modes of inquiry for qualitative data generation used in the social sciences (Thomas, 2011). But despite its wide use, there is no absolute consensus about the definition and typology of the case study. For coherence, this research paper will understand the case study as a qualitative approach that: “explores a real-life, contemporary bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information ... and reports a case description and case themes” (Creswell, 2013b in Hyett et al, 2014). This approach is useful in situations where the boundary between the phenomenon being studied and the wider context is not evident (Yin, 2009). The case-study approach has been applied in a variety of research fields (Denzin & Lincoln, 2011). As Yin explains: “[w]hatever the field of interest, the distinctive need for case study research arises out of the desire to understand complex social phenomena [and] allows instigators to focus on a “case” and retain a holistic and real world perspective” (2009:4).

Furthermore, the case study method allows the researcher to cover multiple cases and draw a single set of cross-case generalizable conclusions (Yin, 2009; Crane, 1998). Thus, the use of case study will enable me to (1) describe the change project being studied and the context in which they are situated; (2) explain the nature of the changes, of the linkages and the processes that are too complex for other methods (such as the survey) and; (3) enlighten and inform the
situation of the change projects and generate conclusions from the practice.

The data necessary for the present inquiry will be gathered through the following qualitative research techniques: individual interviews, focus groups, document analysis and field notes. The rational behind this choice of tools is that each will provide different types of data and will as such be applied to gather data from different respondents. Together, the different tools will help me “triangulate” data between different sources. Approach and probing the same phenomenon under different approaches will help me obtain a more complex picture of the phenomenon under study. As such, I will now outline the different tools that have helped me gather data and explain the relevance of their use in the present research.

4.3 Research methods
4.3.1 Research process
Before I outlining the range of data gathering techniques used in this study, it is relevant to describe the entire study process. As described earlier, this research comes at a time when the different change projects in different Botswana teacher educations have been evolving over the last two years. Therefore, it is relevant to describe how I came to be involved in the ESSA programme and how I formulated my study.

In the autumn of 2014, through an internship organized in partnership with Uppsala University, I became familiar with the work of SWEDES. During this time, I developed an interest in the work of the ESSA program and its aim to strive for the infusion of ESD in Southern Africa. At the end of my internship it appeared that there was an opportunity for me to write this present master thesis and focus more in-depth on the ESSA program. With the help of Sheperd Urenje, ESSA program administrator, I came in contact with Dr. M.J. Kethlholwe, Lecturer at the University of Botswana. Dr Kethlholwe’s help was instrumental in the development of this research as he enabled me to come in contact with the relevant education officer at the Ministry of Education and Skills and the different change project coordinators in Botswana. After initial communication with the Ministry, it appeared that the need to visit the different change projects in Botswana was relevant not only in the context of this present study, but also for the overall institutionalization of ESD in Botswana for which the Ministry is responsible. In Botswana, I was accompanied by two senior lecturers of the University of Botswana, and a Ministry representative to visit the institutions that had participated to the 2013 ESSA workshop. The Ministry of Education in collaboration with Dr. Kethlholwe arranged the different focus groups. Table 4 summarized the study’s research and analysis process. The following part explains how and why different data collection techniques were used in the different institutions.

4.3.2 Individual interviews
Interviews can be described as a managed verbal exchange (Ritchie & Lewis, 2003) where the aim is to “explore the views, experiences, beliefs and/or motivations of individuals on specific matters” (Gill et al, 2008). As such, the interview remains one of the key methods of data gathering used in qualitative research today (Yeo et al, 2014). For the aim of the present study, semi-structured interviews were thought to be relevant. As a type of research interview, “semi-structured interviews consist of several key questions that help to define the areas to be explored, but also allows the interviewer or interviewee to diverge in order to pursue an idea or response in more detail” (Gill, et al, 2008: 291). This feature was crucial as divergence from the interviewer and the interviewee was not only thought to be allowed, but also required to explore idea and responses into more details. Semi-structured interviews were used solely with the change project coordinators whose project focused on the infusion of ESD into the curricula for which they are
responsible and when they were the only ones involved (i.e. not part of a committee involving a larger number of people). This type of interview was used in the case of the two change project coordinators at the University of Botswana.

All the interviews were tape-recorded and transcribed as it allowed for further in-depth analysis of the content that was discussed (Legard et al, 2003; Turner, 2010). At the start of each interview, I would make sure to ask the permission from the interviewees before starting the recording and outlined what the aim of my study was and how the data gathered through the interviews was meant to be used. Length of the interview, anonymity of the interviewees and assurance that the participant was able to ask questions during the interview were also addressed (Whiting, 2008).

4.3.3 Focus group

The use of focus groups in social research as a tool to generate data has received increased attention over the last two decades (Finch et al, 2014). A focus group, as outlined by Krueger & Casey (2014), features “a small group of people, who possess certain characteristics, provide qualitative data in a focused discussion to help understand the topic of interest”. As such, this method is used to gather data on the participant’s different views, to understand the meaning that is associated with those views, and, importantly, to enable to gather data on the interaction between the participants (Gill et al, 2008). This method was deemed to be relevant to the present study as it enabled the exploration of views and perceptions, both from students and teacher educators, about the change project and the infusion of ESD in the curriculum.

The composition of the group and its size is crucial to develop a discussion that is fruitful to analysis (Morgan, 1998). The recruitment of the students and the formation of the different focus groups was done with the help of Dr Ntha Silo and Dr. Boikutso at the University of Botswana and of Mr. Isaac Seetso at the Molepolole College of Education. A focus group preparation sheet and consent form was developed beforehand based on the frame created by Krueger & Casey (2014) (see annex 1).

In the case of the students at the different institutions, I started the focus group by posing a question that would be easy to answer and that would avoid inducing stress in the participants. I often opened the interviews with a question about a matter of fact, such as the year of the students’ first registration and continued to discuss, for a short time, how they were doing so far. Once I felt that the participants where comfortably interacting with each other, I would introduce the questions that I had initially prepared (see annex 2).

Regarding the teacher educators, focus groups were used in 2 ways. First, focus groups were used as a way to generate data about the different change projects that had not as main focus the infusion on ESD into the curriculum of teacher educators in the different institutions (Serowe College of Education, Francistown College of Education, Tonota college of Education and Tlokweng College of Education). This enabled me to receive a greater understanding of the context within which the different change projects have been developing since they were started in 2013. Importantly, these focus groups were not recorded as they did not form part of the primary focus of this study (i.e. mainstreaming of ESD into teacher education curriculum). Field notes were, however, taken during the those focus groups and enabled me to receive a greater understanding of the wider institutional and political context in which the different change projects are being articulated.

Second, a focus group was used in the case of the Molepolole College of Education where the change projects committee comprises of four Heads of Department. In this context, the use of
individual interviews would have consumed too much time.

When starting the focus groups, I always outlined what the aim of my study was and how the data gathered through the focus group was meant to be used. Importantly, a set of rules and guidelines for the interviews was developed as it enabled to set the context within which the participants were intended to interact (see annex 3).

4.3.4 Document analysis
Analysis of relevant policy documents, government action plans, educational strategies and course outlines were also used as a form of qualitative data gathering. Defined as “a systematic procedure for reviewing or evaluating documents” (Bowen, 2009: 27), the procedure enables to appraise and make sense of the data that is found in a document. As such, the data yielded is under the form of excerpts, quotations or passages that are subsequently organized in themes and categories (Labuschagne, 2003). Importantly, this form of data gathering is often used in association with other qualitative research methods as a means to ‘triangulate’ and validate other sources of data (Atkinson & Coffey, 1997; Bowen, 2009). Change project reports, policy documents and student assessments were the main documents that were analyzed for this study.

4.3.5 Field notes
In addition to the methods outlined above, my data collection also included the use of field notes, which complemented the data gathering techniques outlined above. In essence, field notes are notes of observation or, in some cases direct quotes taken during the gathering of qualitative data (Sanjek, 1990; Thorpe & Holt, 2008). Three types of field were used notes during the gathering of data, namely: mental notes, jotted or scratched notes and full field notes (Thorpe & Holt, 2008). Mental notes were used in the occasion when it was considered inappropriate or untimely to take written notes. Jotted or scratched notes were taken at the time of discussions and gather highlights or important moments that I meant to address at a later stage. Full field notes were taken when the situation allowed me to write down note as fully as possible (ibid). As indicated by Webb (1991), the use of field notes can be used at every stage of the research work and present as thus a strong tool for creating consistency and coherence in the development of the research.

In this study, field notes were primarily used during the focus groups in those institutions that had not for primary focus the infusion of ESD in the curriculum of teacher students. This type of data collection was deemed relevant as it would complement the data gathered from the change projects that were explicitly focusing on infusing ESD in teacher education, namely University of Botswana and Molepolole College of Education.

4.4 Data familiarization and analysis

4.4.1 Transcription process
The transcription of interview data into text form is a common practice in qualitative research. The aim of this method is to identify content and the function of speech. There are, however, practical issues regarding the transcription of interviews. Wellard & McKenna (2001) for example discuss whether the researcher should do the transcription of the interviews themselves and, additionally, if more than just the verbal elements of the interview should be brought into textual form. In the present research, transcription was done by the research himself and primarily for economic reasons. Also, it is thought that the type of transcription used in this research was a way to balance out this drawback. Focus of the transcription process in this
research is on verbatim transcription where the conversation was written down as accurately as possible and without conveying a detailed description of the conversation where breaks and gestures, for instance, were noted down (Halcomb & Davidson, 2006; Merriam, 2009). This approach provided a database that is most pertinent to the analysis required.

Data transcription was aided through the use of computer software that can slow-down or accelerate the speed of the play back of the recorded interview. This was a considerable aid in the transcription process.

4.4.2 Data analysis
Data analysis is not an independent or isolated process. It is inextricably linked to the theoretical framework with which the researcher develops the approach to the phenomenon being studied. Hasslöf (2015) suggests that “When analysing qualitative empirical data there are always considerations of selection involved in the analytical processes […]. The analytical framework has to be chosen in a way that gives good possibilities for answering the stated research questions; hence, the selective processes already begins when collecting the empirical data”. Accordingly, the approach followed in this study is what Elliot & Timulak (2005:147) call a “descriptive –interpretative” approach. The study is descriptive as the theoretical framework described earlier will be the lens with which I will analyze the data and identify themes that relate to the different theories used in the frame. At the same time this study is based on an interpretative approach of the data. Based on the frame proposed by Schutt (2011), qualitative data analysis goes through the following steps:

1. Documentation of the data.
2. Organization/categorization of the data into concepts.
3. Corroboration/legitimization by evaluating alternative explanations, disconfirming evidence, and searching for negative cases.
4. Representing the account (reporting the findings) (Schutt, 2011: 325).

In the process above, every step has an important role for within the process of analyzing the data. First, the documentation of the data is a way to prepare for the rest of the analysis. During this step the data was organized and the various contact lists, interviews, written documents and other important data sources were listed into one document (Schutt, 2011). This helped me to keep track of the different interviews and focus groups that I intended to carry out and to contact relevant participants accordingly. Then, in the next step of the frame above, the wide amount of data is reduced as it is divided into relevant categories and themes. Here the different themes outlined in the theoretical framework were used as a guide to organize the data. I extracted the quotes from the interview and focus group transcripts as well as relevant from analyzed documents and organized in tables. Those can be seen in the annex section of this research. Then, based on those different themes and the different source of data, the role of the researcher is to triangulate the different sources and corroborate information. This process of verification enables to legitimize the information that emerged from the different sources and enable the researcher to understand the phenomenon under study. I compared quote with similar themes together in order to verify the participant’s claims. Finally, when data has been checked, the researcher reports the findings and outlines the different results that emerged out of the analysis (ibid). In this final phase I selected the quotes that were most representative of the emerging theme and discussed it in chapter 5.

Table 4 here below outlines how this frame has been used in the present research to analyse different data types harvested from the variety of sources used.
4.5 Ethical considerations

4.5.1 Ethical issues associated with the interviews

It is undeniable that the interviewer is responsible for the quality of the discussions as his/her behavior and previous experiences as a researcher will impact the outcome of the interviews. As such, there are many ways in which the situation before, during and after the interview might bring up ethical problems. Allmark et al (2009) did a literature review of ethical issues pertaining to in-depth interviews. While in-depth interview were not used in this study, I chose to use a frame inspired by these authors as a way to guide the interview process. From their work a list of crucial themes emerged, notably:

- Privacy and confidentiality
- Informed consent
- Dual role and over-involvement
- Politics and power

The above themes were considered in preparation for and outlined at the start of each interview. Privacy and confidentiality of the participants were important as it was believed that the change project coordinators’ professional and personal interest might clash with institutional or wider political agendas. Informed consent refers to the participant’s understanding of how the data gathered during the interviews would be used in the writing of this research. This had already been addressed at an earlier stage during the initial communication process where aims and objective of this research were first introduced. Dual role and over-involvement refers to the idea that, as Allmark (2009: 50) explains “the researcher may take on a dual role as scientist and therapist”. The separation between both is, indeed, rather fine. The author explains that, while during an interview a researcher might attempt to foster the participants’ self esteem, it is for the aim to receive quality data. This issue, while relevant in the present research, is believed to not
have affected the way in which data was gathered.

There were however, also other forms of ethical challenges that emanated from the nature of the relationship that I had with certain participants. In two instances and prior to the interviews, I had already discussed some aspects of their respective change project as well as other change projects in Botswana with the change projects coordinators at the University of Botswana. While this might represent an important bias in terms of the data generated during the interviews, I believe that our relationship did not prevent them to express their thoughts and to be honest and critical in regards to their change project. If, as Reiman (1979 from DiCicco-Bloom & Crabtree, 2006: 319) suggests, “the outcome of interview research should enhance the freedom of the participants more than it enhances the author’s career”, then I believe that despite my limited experience, the interviews carried out for the purpose of this research enabled the participants to express themselves and explore areas that they saw fit during the interviews. I both cases the discussion prior to the interviews helped me to understand the wider political and institutional context in which the different change projects had evolved. This necessary step was a way to receive a more complete picture of the ways the different change project had been implemented in Botswana.

Finally, one more element that was included in the development of this study is the issue of data ownership. Due to issues of confidentiality and for the purpose of the respondent’s integrity, data were not shared or revealed. After completing the data collection, I presented some preliminary findings, interpretation and recommendation to a contact at the Ministry of Education and Skills Development, Department of Teacher Training and Development.

4.5.2 Ethical issues associated with the focus groups
Similarly to the ethical issues associated with interviews, when designing and preparing for the focus groups, I made sure to consider the issues of privacy and confidentiality, consent, harm, dual role and over-involvement and politics and power. What was also important when dealing with large groups with multiple personalities was the challenge of domineering participants. In one case where a student was clearly dominating the discussion, I tried to find ways to shift the attention to other participants by withdrawing eye contact from the dominant participant to other members of the focus group and gesturing others to speak.

One of the Colleges of Education that I visited had planned for me to talk with the students from different disciplines and, afterwards, visit the college to see how one of the art teachers had embedded the notion of ESD into its teaching. When preparing for my focus group, it appeared that the said teacher was going to stay in the same room while I was meant to carry out the focus group. After some subtle attempts on my behalf, it appeared that the teacher did not pick up my intention and thus remained in the room. While this can certainly limit the participants’ ability to talk freely, it was appraised that it did not prevent critical discussion about the course. And indeed, later during the interview, one student appealed to the teacher for help in making her point, which led me to think that the nature of the relationship between student and teacher was comfortable enough to enable a relaxed and honest discussion.

4.5.3 Understanding my own biases and perceptions
While the theoretical framework, combined with the methodology and the tools used in the present study have undeniably fashioned the way I have approached the phenomenon under study, it is important to realize that my own understanding, perceptions and limitations are, if not more, crucial when it comes to evaluating the validity of the present research.
Prior to my data collection visit I knew little about Southern Africa and about Botswana. Therefore, I believe it would be honest to say that my approach was tainted by the biases of an outsider who is attempting to understand the world in which he or she is stepping into. As such, it was important for me to take a reflexive approach and thus understand how my personal self (i.e. my subjectivity) came to affect the way in which I was approaching the research. Being reflexive, understood as an “awareness of the researcher’s role in the practice of research and […] enabling the researcher to acknowledge the way in which he or she affects both the research process and outcome” (Haynes, 2012: 72), helped me understand how my history and past experiences have come to develop my interest for education and have fashioned the way I approached the present research. My earlier internship at SWEDESD and my experiences as an educator have definitely sparked my interest for education. But they have also strengthened my belief in education and the importance that student engagement and student participation have in regards to ESD. (Archer, 2012). Being a student myself, and interacting with students during focus groups, there might have been an ethical issue in regards to the view I hold towards the role of the students and the agency that some students expressed. However this ‘bias’, through a reflexive approach, enabled me to identify some cultural and institutional features that are impacting the way in which student engagement and student agency were being affected. This reflection, what Finlay (2002) terms as “Reflexivity as social critique”, became a way to understand how engagement, agency and participation are elements that need to be understood in relation to the wider enabling context in which it is situated.

4.5.4 Conclusion
This chapter discussed how I opted to use the case study rather than a survey in my research, different methods were used to gather the relevant data. I also discussed the different ethical issues that I encountered prior and during the collection of data in Botswana. In the next chapter I will outline the data that I gathered and discuss how the different change projects evolved since their first formulation at the cluster workshops of 2013. I will also seek to triangulate different sources of data to provide an answer as to how various variables and factors have influenced the extent to which and the manner in which ESD infusion was a results from the change projects initiated by the ESSA programme.
5. Data analysis and discussion

5.1 Introduction
The following data analysis and discussion will enable to draw connection between the two elements considered here: the notion of change project and the notion of ESD infusion. In this chapter I will delve into the data and attempt to link how the strength of a given change project group in regards to themes associated with the theory of change correspond to the way the teaching and learning practices have changed in a given institution.

First, in part 5.2, I outline the data that were gathered through field notes in the institutions that did not have for primary focus the infusion of ESD in teacher education. This part is meant to give the wider context in which the different institutions developed their change projects. Then, the remainder of the chapter attempts to answer research question 1 and research question 2 respectively. In part 5.3 I describe how teaching practices have been evolving since the cluster workshop of 2013, and how they have contributed to a change in understanding of sustainability issues. In part 5.4 I describe the way in which “ESD infusion” change projects have been implemented in their respective institutions and the different elements that have contributed or inhibited the process.

Table 5 below outlines how the different change projects have evolved at the time of the visit in March 2015. The content of the table will be discussed more in detail in the following parts.

5.2 A wider perspective
Data harvested under the form of field notes at institutions whose change projects were of “physical” nature enabled to develop a wider understanding of the role that context has in relation to change project implementation. In this part I will outline the main elements of that context and point towards possible explanations.

The theory of change, as developed earlier, explains that the understanding of the concept with which the group is working with is crucial for its implementation. Indeed, as is shown in Figure 6, the organization’s resources and skills, but also the wider receptiveness of the context are crucial when considering the way in which a given project will develop over time. Here, I will briefly describe how the different change projects have evolved since their articulation and propose a few reasons for it.

As displayed in the table 5, two out of the 6 change projects that were developed after the cluster workshop in 2013 are directly linked to ESD infusion as they focus on curriculum review, teaching methods, learning support materials and student assessment. Other change projects in Botswana and initiated during the ESSA workshop are focused on addressing environmental and physical elements of the institution in which the change project was implemented. Initial speculations by the workshop organizer about the reason why a change project did not reflect the workshop objectives of enhancing the quality and relevance of teacher education were that “this [situation] shows the powerlessness of participants to effect real changes in the curriculum and so they decided to plan change projects outside the mainstream curriculum e.g. planting trees, water harvesting and waste management” (ESSA, 2014:18). The data enabled to delve deeper into the reasons for this apparent “powerlessness” and unveiled two separate reasons why this might have been the case: their level of ownership and their partial understanding of ESD.
<table>
<thead>
<tr>
<th>Institutions</th>
<th>Description and Current state of change project</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Botswana (UoB)</td>
<td><strong>Infusing ESD in the Curriculum of teacher trainers (change project coordinator 1 &amp; 2)</strong></td>
</tr>
<tr>
<td><strong>Achieved:</strong></td>
<td>- Change project coordinator 1: - ESD is now ‘integrated’ in the curriculum and influences the development of materials and evaluation relevant for training and learning process</td>
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<tr>
<td></td>
<td>- Proposal developed for a pre-service course termed introduction to education for sustainable development</td>
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<tr>
<td></td>
<td>- Change project coordinator 2: - Developed template for sustainability assessment</td>
</tr>
<tr>
<td></td>
<td>- Trialed assessment model with students</td>
</tr>
<tr>
<td></td>
<td><strong>In the process:</strong> - Application for introducing a Master programme in environmental and sustainability education</td>
</tr>
<tr>
<td></td>
<td>- On-going process of developing and integrating ESD in teaching and learning practice</td>
</tr>
<tr>
<td>Molepolole College of Education (MCE)</td>
<td><strong>Curriculum innovation and material development</strong></td>
</tr>
<tr>
<td><strong>Achieved:</strong></td>
<td>- Topics identified from which the concerned departments (Arts, English, Science, Guidance and Counselling) could draw ESD aspects to be infused in their teaching</td>
</tr>
<tr>
<td></td>
<td>- Activities designed in the 3 subjects with samples of how to infuse elements of ESD</td>
</tr>
<tr>
<td></td>
<td><strong>In the process:</strong> - Sensitising the academic Heads of Departments and Student Representative</td>
</tr>
<tr>
<td></td>
<td>- Sensitising the academic Heads of Departments and Student Representative</td>
</tr>
<tr>
<td></td>
<td>- Sensitized staff on principles about ESD</td>
</tr>
<tr>
<td></td>
<td>- Survey of ESD practices in institution conducted</td>
</tr>
<tr>
<td></td>
<td>- Water tank installed</td>
</tr>
<tr>
<td></td>
<td>- Change project included in institution’s strategic plan</td>
</tr>
<tr>
<td></td>
<td><strong>In the process:</strong> - Communication with engineering company</td>
</tr>
<tr>
<td></td>
<td>- Plan for water harvesting</td>
</tr>
<tr>
<td></td>
<td>- Linking water tank with kitchen waste water</td>
</tr>
<tr>
<td></td>
<td>- Including learning in curriculum development</td>
</tr>
<tr>
<td>Serowe College Of Education</td>
<td><strong>Combination of Rainwater collection and borehole rehabilitation</strong></td>
</tr>
<tr>
<td><strong>Achieved:</strong></td>
<td>- Formed a steering committee to implement change project</td>
</tr>
<tr>
<td></td>
<td>- Water wells identified and cleaned</td>
</tr>
<tr>
<td></td>
<td>- Change project included in institution’s 2015/2016 budget</td>
</tr>
<tr>
<td>Francistown College Of Education</td>
<td><strong>Grey Water use: towards a sustainable environment</strong></td>
</tr>
<tr>
<td><strong>Achieved:</strong></td>
<td>- Stated aim: to make ESD part of the college activities</td>
</tr>
<tr>
<td></td>
<td>- Formed a steering committee</td>
</tr>
<tr>
<td></td>
<td>- Adapted change project to local realities</td>
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<td></td>
<td>- Outlined strategy of implementation</td>
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<td>- Sensitized staff on principles about ESD</td>
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<td>- Survey of ESD practices in institution conducted</td>
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<td><strong>In the process:</strong> - Linking water tank with kitchen waste water</td>
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<td></td>
<td>- Including learning in curriculum development</td>
</tr>
<tr>
<td>Institution</td>
<td>Project Description</td>
</tr>
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<td>-------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------</td>
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</tbody>
</table>
| Tonota College Of Education                     | Management of College Environmental Outlook (stated aim: to address litter picking, manage displacement & replacement of college furniture and maintenance of college landscape) | - Formed a steering committee                                                  | - Adapted change project to local realities  
- Identified indicators of implementation  
- Included in 2014/2015 Strategic Plan  
- Ran workshop to sensitize other heads of departments to concept of ESD                                                                 |
|                                                 |                                                                                     |                                                                               | **In the process**: engagement of college community members through litter picking campaign **                                                                 |
| Tlokweng College of Education                   | Make a hotbox                                                                       | - Formed a steering committee                                                  | - Ran workshop to sensitize other heads of departments to concept of ESD  
- Adapted change project to local realities                                                                                                                |
|                                                 |                                                                                     |                                                                               | **In the process**: Develop energy conservation project with students  
- Explore possibility of grey water harvesting project                                                                                                     |
| Ministry of Education and Skills Development, Department of Teaching and Training Development | Provide a support system for colleges of education                                 | - Sponsored teachers and lecturers to attend workshop and conferences related to ESD | - Organized conference to share experience of change projects  
- Funded of change projects                                                                                                                                     |
|                                                 |                                                                                     |                                                                               | **In the process**: Identification of College needs with regards to change projects  
- Promote infusion of ESD in teacher curriculum                                                                                                                 |

Table 5: evolution and achievements of change projects
First, several change project coordination teams told that they do not have ownership of the creation and development of the curriculum in their classrooms. Field notes taken during the visit of the teacher colleges whose project focused on a “physical” change demonstrate that at two different institutions, members of the change project teams mentioned that they felt that “our hands are tied” in relation to curriculum infusion. All change project teams also mentioned that resource constraints were the most important element preventing them to carry their institutional change project forward. This reveals a partial understanding and leads to the second reason for the coordinating teams’ apparent powerlessness: a mis-understanding of the concept of ESD.

Indeed, in only one of the institutional change projects (Francistown College of Education) was it mentioned that the physical project will be used to inform and be included in the curriculum of the students on campus. This reveals a partial mis-understanding on behalf of other institutions in regards to the notions that (1) the infusion of ESD in educational institution can be facilitated through physical but also curriculum change, and that; (2) ESD can be understood as a concept that can be infused across different disciplines regardless of their core subject.

With respect to (1) above, it is interesting to note that in the different institutions where change projects were developed there was a different ‘understanding’ of ESD’. Field notes, interview transcripts and the analysis of institutional change project reports enabled to understand the way in which the project is, or not, addressing wider learning outcomes. The institutions that had developed a “physical” change project seemed to comprehend and approach ESD in terms of Vare & Scott’s (2007) ESD1. ESD 1 is based on an approach that “assume[s] that the problems humanity faces are essentially environmental, and can be understood through science and resolved by appropriate environmental and/or social actions and technologies” (2007: 192). As such, those different change projects sought to address local issues in a manner that perceives ESD as grounded in resource conservation and that the natural environment of the institution can be improved through more efficient management. In the case of Serowe and Tonota Colleges of Education, the institutional change project addressed problems that were relevant in their conditions: water scarcity and litter management. In both cases, the change project team decided to focus on developing projects that would seek to reduce water consumption. In the case of Tlokweng College of Education, the change project team decided to focus on the construction of a hotbox by students. Using locally available materials, a hotbox uses the principles of insulated cooking and enables to keep the heat that is used to cook food inside the receptacle in which the food is present. In the three cases, the change project outcomes were meant to be used for “promoting (informed, skilled) behaviours and ways of thinking, where the need […] is clearly identified and agreed” (ibid, 193). In the case of Francistown College of Education, this is more nuanced as the change project accommodates both a physical as well as a pedagogical element. Indeed, the change project team organized a workshop to sensitize heads of department to the concept and principles of ESD, but the change project report developed by the committee fails to explain how the physical element (grey water harvesting) will be integrate with the teaching and learning practices in the institution.

In relation to (2) above, it was important to notice that the understanding of the concept of infusion was also crucial in the development of the change projects. Indeed, in the institutions where ESD infusion was understood and carried out in teacher curriculum (University of Botswana and Molepolole College of Education), the teacher educators and head of departments carrying out the change projects actively attempted to develop pedagogical
materials and influence the teaching and learning practices for which they had control or influence over.

Overall, the majority of the change projects that were initiated by teacher educators during the cluster workshops in 2013 had to be accommodated or changed when integrated back in their home institutions. The data give clues as to the reason why this has been the case. In the institutions where a change project committee had been developed, several participants mentioned that they had encountered some difficulties in sensitizing colleagues with respect to the new knowledge they had acquired during the ESSA workshop. While, as was just discussed, their own understanding of ESD might have been limited or unclear after the workshop, this aggravated when it was time to communicate the aim and principles of ESD infusion. This relates to what Vogel (2012a:15) describes as the “conceptual clarity” that is necessary when planning for change. In this present context it explains why in the cases where a committee was formed the change project dramatically changed in focus and orientation. One of the members of the change project team in Tonota College of Education for example, explained that it took the team more than six months for the change project team to change focus of the original project towards a new project. This, he explained, was associated to the fact that as he brought back the learning from the ESSA workshop back to his home institution and presented it to the committee that had formed around it, the group experienced difficulties in identifying a new problem in relevance to his experience. Finally, only one change project that was initially articulated at the cluster workshop of 2013 has remained unchanged. Change project coordinator 2 (see figure 5) at the University of Botswana, whose projects looks at integrating ESD in pedagogy and student assessment, still was working on developing such material at the time of the visit.

5.3 ESSA and teaching practices

The aim of this current part is to understand the extent to which the change projects contributed to a transformed understanding of sustainability issues in the training of teacher students and to evaluate how teaching and learning practices changed in this regard. Therefore, we will now discuss the effect of the change projects, whose focus was on teaching practices, in terms of teaching methods, learning support materials, assessment and curriculum. In this part only the change project at the University of Botswana (UoB) and Molepolole College of Education (MCE) are considered.

As discussed earlier, transformative learning in the context of sustainability is what Wals describes as “a form of learning that enables alternative and new kinds of thinking and solutions that are “co-created [and] co-owned by more reflexive citizens, living in a more reflexive and resilient society” (Wals, 2007: 42). As such teaching practices and learning outcomes were evaluated with regards to the experiences and views that the students expressed towards the courses where ESD was meant to be infused. A triangulation of document analysis with field notes, interviews and focus groups with change project coordinators and students enabled to do this comparison. Annex 5,6,7 and 8 gather the different themes that have been identified during the interviews and focus groups.

5.3.1 A change in teaching practices?

The range of teaching practices that have been implemented after the cluster workshop of 2013 differ widely between UoB and MCE. Annex 6 and 8 gather the different themes that were expressed by the change project coordinators in the University of Botswana and the
Molepolole College of Education respectively. In relation to teaching practices, the change project coordinator at the UoB expressed 10 themes while those at MCE expressed 3. In the case of MCE, the change project committee gathered four Heads of Department from the discipline of Arts, English, Science and Guidance & Counselling. Together the team developed a manual outlining how they work towards infusing ESD in their respective classes. It is divided into different topics (crafts, transport, energy, essay writing, social skills development…) and outlines a list of activities that the teacher educators have created. For each topic, the manual outlines what the learning outcomes and objectives are and the different activities that are meant to achieve them.

An analysis of the ESD manual helped identify some important features of the overall approach that is prevalent throughout the document. In many instances, the learning outcomes that are mentioned for each activity relate to what Scott and Vare (2007) describe as ESD1. As an approach to learning, ESD 1 is characterized by the notion of expert-driven knowledge and “involves raising awareness of the necessity for change and ‘signposting’ goods and services that will reduce the ecological footprint of our activities” (Scott & Vare, 2007: 193). This approach is expressed in the following learning outcomes that were extracted from the document.

**Biology**

**Topic 1: destruction of the ecosystem**

**Learning outcomes:**

- Describe deforestation
- State the reason why humans destroy ecosystems
- Explain the irreversible impacts of deforestation

**Guidance and Counselling**

**Topic 3:Example of self employment available to the youth**

**Concepts to be learned from the activity:**

- Is Botswana a good place for bird watching?
- Natural products in our environment can be used to sustain ourselves
- Pottery studios are producing some interesting designs, notably the studio in the village of Thamaga where exceptional skills combine with modern ethnic design

Here, the overall approach that is fostered through these examples illustrates an approach that presents what a “sustainable” behaviour might be like. This approach inherently perceives education as instrumental in delivering the relevant knowledge from the teacher-expert to the student-receiver. Interestingly, this approach in the manual also emerged out of the focus group that was carried out at the institution.

“We are all aware that nowadays we are using fossil fuels in the form of energy resource. Yes, so here we are actually sensitizing the students to realize that this is the fuel that is actually bringing about this climate change and this rise of CO2 and CH4 gases. So we are basically trying to make students realize that when these resources are used they should be used with care, and take care of the ecosystem”

“One of the activities was that they had to look at different activities that they are doing, it s
some kind of a game, they look at what people are doing. They seek out, look at long traffic
of cars with single driver in it. They see the use of power from fossil fuels, from wind-
generated power, all those different activities that are happening around them. And then they
have to grade it, and gave them points. If it is greening the economy, it gets positive points, if
it is contributing negatively to the environment it gets negative points. And then in the end
they are able to add them. After the game we expect them to bring it into the real life and want
to help them make good decisions for them to get a bus to school or to cycle. Give themselves
points. So they should be able now to do it in real life, and keep this mark at the back of their
minds”

Here, two distinct teacher trainers express the notion that their role as educator is to ‘sensitize’
and ‘make the students realize’ what a correct behavior is in relation to the subject that they
are teaching. They do not seem to be of the position that the students should be able to think
critically or explore by themselves the many contradictions that are inherent to sustainable
lifestyles as is explained in ESD 1. In this instance, it was interesting to observe how their
understanding of ESD, and of the wider role of education, also informs the way in which
teaching practices in this regard have changed. When asked how the teacher educators
attempted at bringing about new ways of teaching and learning into their classrooms, the
participants struggled to articulate how new in-class practices participated to a new
understanding of sustainability issues.

“Maybe we are doing it unconsciously, like I said what we are interested about is equipping
our students and then we are hoping that when they get to their classrooms they will be
equipped to empower their learner as well”

In the above quote, the participant explain that her approach to ESD pedagogy is what she
explained ‘unconscious’ and therefore denotes a lack on behalf of the wider group to have
discussed but also fully grasped what ESD as an educational concept represents. This lack
was present throughout the transcripts of the focus groups as is denoted by the absence of the
terms such as pedagogy, practices or curriculum. Relating back to the research framework,
this lack in teaching practices can be explained by the approach that is thought to be relevant,
by the change project team, in regards to education. Indeed as was unveiled earlier, the
change project group approached their teaching as is understood in ESD 1, which inherently
does not incorporate a transformational element in its approach. As such, discussions within
the group as to what kind of pedagogy should be fostered for ESD has not occurred.

While this might have been the case at the Molepolole College of Education, the situation is
quite different for the two change projects initiated at the University of Botswana. Project
coordinator 1 has, since the cluster workshop of 2013, worked towards the infusion of ESD
processes in teaching practices and teaching material. From the interview transcripts several
elements relating to the transformational processes identified by Wals and Corcoran (2007)
(see table 2) were identified.

“The values perspective. That is what I try to build into my courses. There are different ways
to look at issues, and it is only through a change of our value system that we can access it.
And I adapt it to simple things like resource consumption. We use day-to-day examples with
our students… Then we look at our consumption patterns in terms of resources: how many
cell phones, coming from The Parts and The Whole, how many have you used in such and
such a time. And how many do you own: how many TVs and all these things. It is really in
terms of attitudes, our lifestyles, values, what our values are as a people.”
Here, the participant describes her overall approach in her teaching which relates to what Wals and Corcoran (2007) term “The value of valuing” and which seeks “to expose the learners to alternative ways of knowing and valuing through self-confrontation”. Also, by the use of practical examples, she uses an approach that the same authors describe as a “total immersion” of the students in a specific case. Analysis of the course syllabus and course outlined enable to strengthen this finding. Indeed, the documents show that change project coordinator 1 uses different examples (issues around the import of cars, water management issues in the Nile Basin...) with her students, fostering a experience with a real life phenomenon.

When approaching the data with the lens of social learning, notably the idea of interdisciplinarity emerged in several occasions during the interview. When discussing teaching practices, she explains:

“I really try to push for this holistic approach, looking from the political perspective and give examples from Botswana for example. When I do my test and assignments, I use global examples. And I look at how you can address these 4 components: social, economy, biophysical and political perspective. …So that is the key of the course. It is a good way to map out. And for any activity that we do, that is the approach that I emphasize”

Both quotes above denote that change project coordinator 1 is, to a certain extent, aware of, and working towards, teaching processes that can foster the transformation of mental models in the classroom. Similarly, change project coordinator 2 has, since the original formulation of his change project, worked to develop a model of assessment based on a similar approach. As he explains:

“What does a term paper do? It is to identify a critical issue, like one of the course that I do here is a course in social studies and nation building and one of the critical things is the so called Baswara from the central Kalahari game reserve to new settlements. That was a very topical issue because is even went to the high court and so on which is a landmark that we talked about for four years now. What I think is that we need to revisit events and together with the students if we could have perhaps done the relocation differently. So basically, what this term paper does, is to try, and I am not trying to dictate the learners, but I am trying to get them into groups to see that here there is an issue”

The participant refers to a new assessment that he has introduced and developed since his attendance of the cluster workshop in 2013. The term paper is a case study which gives the students the opportunity to explore a specific issue in depth (in this case the removal of the Baswara people from the Central Kalahari Game Reserve) and allows them to develop, in groups, their own inquiry. As such, this exploration represents a way to what Wals and Corcoran (2007) refer to as “digging for meaning by studying an issue in-depth and looking for transferability to other areas”, and which, according to the authors, represent a process of transformative learning. Importantly, the term paper allows students to articulate, in groups, the way they desire to approach the issue. Annex 4 outlines the wider diversity of different term paper titles that have emerged from this inquiry. With the lens of Human Capability and Education for Sustainable Human Development, this process of self-reflection and the development of locally relevant knowledge is a way for the students to develop the capabilities of reasoning and agency that are relevant to ESD. In addition to of a group term paper, the students taking change coordinator 2’s class also are assessed individually during a term exam. The effect of the cluster workshop on the development of the term exam is in this case particularly significant as is denoted by the way his term paper has been
evolving since 2012. A review of the examination documents of 2012, 2013 and 2014 helped identify some important changes in the overall approach that is prevalent throughout the documents. While early examinations sought to test students on their ability to deliver information that was learned at an earlier stage, the examination of 2014 asks the students to be critical and analytical in regards to different narratives. This notion was further confirmed during the interview. When asked about the evolution of his term exam, he explains:

“After the workshop, this was in 2013, you can see that somehow in terms of the exam, I was gradually beginning to infuse the issues of strong sustainability, especially critical thinking. You look at the type of questions that I have there… In 2014, if you look at the last semester’s exam, you look at the way I have set my examination questions, it is totally radical. It is a different way to look at it, where I use some sort of a narrative. These narratives are from the research papers at the faculty. I don’t want to take narratives from outside. I want to pick narratives from the lecturers that they know. Then what I do is to pick this narrative and ask some questions so that the idea is to have learners who move away from [repeating what they learn] so that they can now apply their knowledge”

Importantly, both change project coordinators at the University of Botswana have developed, in relation to the courses they teach, learning outcomes that refer to ESD 2. Indeed, in both cases, data gathered through analysis of course outlines shows that the teacher educator attempt at creating capacity in the student to reflect on the contradictions that are inherent to the development process and therefore go beyond reliance on expert driven knowledge. This approach is prevalent in the following learning outcomes that were extracted from the course project coordinator 2 is teaching:

Learning objectives

By the end of the course, students should be able to:

✓ Investigate and discuss problems, constraints and challenges associated with nation building projects
✓ Suggest strategies for accommodating ethnic difference and living with cultural pluralism

The two change projects from the University of Botswana have, arguably, been able to develop a greater understanding of learning processes but also methods and evaluative tools in regards to ESD compared to Molepolole College of Education. The presence of the above mentioned themes connote a certain wider understanding of ESD as not just a prescriptive, instrumental form of education, but it denotes an approach that also equips the learners to think and act autonomously. While different teaching practices have been implemented in both institutions after the cluster workshop in 2013, it is interesting to observe if those have resulted in a transformed understanding of sustainability issues by the teacher students. The following part will therefore look if such transformation has resulted.

5.3.2 A change in understanding

The range of responses on behalf of the teacher students varies greatly between the two institutions. Annex 5 and 7 gather the themes gathered during the focus groups for the UoB and MCE respectively. Students at UoB expressed 9 different themes from the evaluative framework while students at MCE expressed 3 different themes. In regards to the students at
the Molepolole College of Education the focus groups where marked by a clear absence of reflections in regards to teaching practices and wider awareness of their individual role in regards to sustainable development. When asked whether participatory processes were being put forward in the class room, the students did not seem to recall any specific moment where such pedagogies had been used. This absence in reflection on behalf of the students draws parallel with the absence of pedagogies on behalf of the change project coordinating group as outlined earlier. The focus groups with students at the University of Botswana did, however, harvest a lot more data. Indeed, when asked about the course which was taught by change project coordinator 1, some of the students explained:

“It has been changing our attitudes towards the environment. Even our behaviors, where we’re practicing things differently compared to how we used to do in the past. Because we now know that there is a need for conservation”

“This course has been an eye opener for us, we can think beyond conserving the environment and we now know how to take care of the environment and we have got now the knowledge of how we can consult other who are not familiar with conservation and respecting the environment.”

Here the students clearly express the benefits that the course had in relation to their understanding of wider sustainability issues. Interestingly, the students also reflected on the different learning processes that led them to receive a greater understanding of certain issues. In the following quote, describing a moment in the class taught by change project coordinator 2, students explained how their experience in sharing their views with those of others enabled to receive a better understanding of the issue they were discussing and how it helped them develop their inter-personal skills.

“We were talking about the story of the forced relocation of the Baswara people from their area. So we were arguing about it. Some people were for the Baswara saying that they are supposed to stick where they are and live in their environment. And I was saying that they also have to go out and enjoy the modern life, go to school. As they were talking there was a girl that mentioned an important point and said that the curriculum doesn’t suit them…it made me realize that is not about all what I think. It helps a lot.”

“I think [learning in groups] was important because we learned from one another and we appreciated the other’s ideas and we could see that we share the same sentiments. But we end up coming to one agreement. We learned how to cooperate and incorporate our ideas as well.”

This, as was discussed in part 5.6, relates to two important concepts from the theoretical framework: “understanding one’s own values in a wider context” (from the theory of social learning) and the notion of “learning about one self” (from the theory of human capability). Together, those conceptual tools explain that learning in groups enables to create a shift in understanding which enables to build collective responsibility and constructive partnership among the participants. The underlying concept that contributes to this is the one of “democratic dialogue” as advocated in the theory of human capability. Landorf et al (2008) explain that the application of democratic dialogue in pedagogy also enables the development of agency in the participants.

“It has been changing our attitudes towards the environment. Even our behaviors, where we’re practicing things differently compared to how we used to do in the past. Because we now know that there is a need for conservation”
Here one of the students relate to the idea that the course helped to develop a certain agency in relation to conservation of the natural environment. Interestingly, a review of student evaluation documents in regards to the course and teaching practice of change project coordinator 1 enabled to extract a variety of elements contributing to the expectation that the course would help develop agency in the learners (see annex 5). In many cases, students explain that field trips are, for them, a pragmatic way to look at a specific issue and enable them to link agency with action.

The different focus groups helped to understand how a change in teaching practices impacted on the way students were learning. This change was strongest in the university of Botswana where it can be argued that the change in practices has undeniably worked towards a grater understanding of sustainability issues and a higher agency in students

5.3.3 Conclusion
This part has sought to provide some answers to the first research question: how did the change projects contribute to a transformed understanding of sustainability issues in the training of teacher students in the Botswana institutions that attended the cluster workshops of 2013? Did teaching practices change in this regard?

Through the lenses of the theory of human capability, the theory of social learning and the theory of transformative learning, the present part looked at how the cluster workshop in 2013 participated to the development of teaching practices and subsequently if those practices subsequently lead to a transformed understanding on behalf of the students who attended the courses taught by the change project coordinators. This enabled to identify two crucial elements that promote the implementation of transformative teaching processes: the change project coordinator’s comprehension of the notion of ESD and the general role that they believe education has in relation to sustainable development. When education is perceived as a facilitation process aimed at empowering the students, participative and collaborative processes are more likely to be brought forward.

The Molepolole College of Education’s manual to infuse ESD in the institution is a great innovation to mainstream ESD. What was missing, however, is how this translated in a change of teaching approaches. In the case of the University of Botswana, the change project coordinators’ understanding seemed to be more complex as is denoted by the way they have developed their course learning outcomes and the teaching practices that they are fostering in the classroom. The students in this regards also expressed a greater understanding of sustainability and valued collaborative processes to be important for their learning. Figure 9 below is an attempt to theorize this present finding.
While the above analysis and associated discussion have sought to look at the data in relation to teaching and learning practices, the next part will seek to analysis how the above teaching practices relate to the way the change project has been articulated, developed and implemented at the different institutions.

5.4 Mainstreaming education for sustainable development in Botswana
This present part will seek to answer Research Question 2. As such it will see the extent to which and how the change projects initiated by the teacher education colleges that attended the cluster workshops of 2013, and who had for focus the infusion of ESD principles, achieved their objectives. Here the theoretical framework of the Theory of Change will be used to identify a list of helping and hindering factors that influenced the extent to which and the manner in which “ESD infusion” resulted from the change projects. According to the theory of change there are a number of contextual drivers likely to influence the development of a given project (see figure 7). Based on this framework, this present part will look more specifically at the ways in which the capacity of the change project team or coordinator, the institutional environment and the wider cultural environment affected the ways in which change projects seeking to infuse ESD in curriculums of teacher trainers developed. Annex 6 and 8 gather the different themes that were extracted from the interview and focus groups with UoB and MCE respectively. Importantly, both change project teams expressed a similar number of themes in relation to the theory of change framework outlined earlier, though they differ by the nature of the themes expressed.

5.4.1 Capacity of change project teams
“To support changes in practice, changes in knowledge, attitude and skills need to take place first, allowed by social interactions and learning processes that support the adoption and adaptation of new knowledge. These eventually lead to new practices.” (Vogel, 2012a :44)

With those elements in mind, a combination of themes extracted from the interviews and focus group transcripts along with field notes enabled to further understand what elements have been important in regards to the development of the change projects. The theory of change explains that the strength of an individual or a group to create change will depend on the capacity to respond to the external environment and use emerging knowledge. As such, the data gathered at the University of Botswana and the Molepolole College of Education was divided into two parts: capacity for implementation and capacity for learning. While the former relate to the ability of the change project coordinator to work towards the implementation of an ESD change project, the latter relates to the ability to make use of new
A) Capacity for implementation

In the case of the Molepolole College of Education, there are different crucial elements that have affected the way in which ESD practices have been articulated. First and foremost, the amount of dissonance between participants in regards to the way in which the concept of ESD itself has been understood was influential in that regard. Indeed, during the focus group, different notions in regards to what the aim of ESD are where mentioned. When asked to describe what the expected change in students’ skills and knowledge the four Heads of Department estimated to see, they gave different answers. Two respondents explained that ESD learning should enable to create engaged citizens that have developed a sense of agency while the other respondents expressed the idea that ESD should include the notion of life-long learning or should aim towards a cleaner environment. This dissonance in the understanding of the concept is crucial if a common understanding and vision for the project is to be built. This dissonance in the understanding of the concept was, however, not present in the change project developed by the University of Botswana. There, since the change project coordinator did not see fit to develop a committee around the project, there would not be any possibility for dissonance or mis-understanding.

Secondly, another theme that was recurrent during the focus group with the change project and which is, according to the theory of change, crucial for the development of a project is the level of ownership on behalf of the project team. The theory of change explains that developing a plan of implementation, having a long-term goal and assigning different tasks to the team enables to develop ownership of the project as it builds agency in the different member. There was in this regard an important lack on behalf of the change project team from the Molepolole College of Education. When discussing the timeframe for the development of the whole project, one member of the change project explains:

“I understand that this is an ongoing project and I was wondering if there is a time limit to it. When we were producing the manual the initial one was 2013 and just this morning I changed it to 2013-2015 because I was wondering about the timeframe.”

The above quote indicates that the group was unclear about the planning of the change project and, implicitly, about the change project’s overall aim. This became quite obvious later during the interview when the idea of monitoring was discussed. One of the participants explained:

“At what point or stage can I be in a position to say ‘I am at the right check’. Do we have the card mastered to provide and give and that would say: ‘if I have done one, two, three, then I know or I am nearer of these expectations’ ”

The notions expressed by the participant here indicate not only the absence of a discussion in the change project group about the planning of the project, but also informs on the level of ownership that is present in the group. Indeed, while some work was accomplished in regards to the expected outcomes of “ESD infusion”, the above quote indicates that the change project group is working towards fulfilling expectations from the Ministry of Education or the ESSA workshop organizers and therefore does not “own” its project. In contrast, transcripts of the
interview with the change project coordinators from the University of Botswana sketch a different picture. There the interviews revealed a strong ownership of their change projects. As is denoted by this quote by change project coordinator 2:

“Let me start by saying that I have embraced the idea of a change project as well as education for sustainable development. So when I plan for my course, at the beginning of the semester, I am mindful of the need to be creative and be innovative.”

While the transcripts reveal the presence of some elements of ownership on behalf of the change project coordinators, there is a clear expression of agency in the following quote from change project coordinator 2.

“I think that as an individual you can make a difference. No matter how insignificant your contribution is, you can tell yourself that if you want change, in your own space that can be realized. I think that this is what this change project seeks to do. It is to look for opportunities, you appreciate the challenges and you now think of new ways to deal with the old problems.”

It is interesting to note that, the institutional situation being different for the college of education and for the university, the nature of the change project had to be adapted to local realities. Crucially, the ability to navigate this institutional environment and find ways to effect change will be crucial for a successful implementation of the change project. In the case of the two change projects that were developed without a committee around it (i.e. University of Botswana), one of the change project coordinators mentioned that the reason to modify her change project was that in its institutional context, the nature of the initial change project would require too many resources. As change project coordinator 1 at the University of Botswana explains:

“But our university is pretty complex, and especially because I wanted to develop material, to get some of my colleague’s input from their different subjects. It becomes complex because here there is so much independent work that is being carried out on their own subject so I was thinking of developing it for teachers, for the practicing teachers that are my students to develop that material, but I realized that would take a long time in terms of resources and so forth”

Her initial change project had focused, as can be seen in table 1, on developing methods and worksheets drawing on ESSA tools and approaches (specifically from “The Parts and The Whole”) for different primary school subjects. In the quote she explains how the institutional environment would make such project too time consuming. During the interview she explained how she decided to change her project and adapt it to a more reasonable and less complex one. Initially, her change project sought to propose the development of materials to promote the approaches in the ESSA publication. This changed to an infusion of the ESSA approaches in her own teaching.

B) Capacity for learning

Crucially, the ability to implement change, relates to the ability to adapt and adopt new forms of knowledge and make use of them in relation to their project (Vogel, 2012a). It is therefore interesting to observe how the content and experiences from the ESSA workshop of 2013 has participated to the development of the change project for the different coordinators and teams.
In a bid to make education more relevant and of quality, the ESSA program relies on the infusion of two important concepts into the curriculum of teacher trainers: strong sustainability and agency. The ability to understand those concepts on behalf of the change project coordinators will inadvertently affect the way those concepts will be taught and approached in the classroom. As such, it was interesting to see how those were understood in the different institutions.

When first asked during the focus group whether those concepts had been difficult to understand at the end of the cluster workshop of 2013, the change project team at the Molepolole College expressed the idea that it had been a challenge to apprehend and, difficult to implement. Change project coordinators at the University expressed the opposite, claiming that it hadn’t been such a challenge and that the content of the ESSA workshop had thus come as complementary to their previous knowledge. When asked about the reasons why this might be the case, change project coordinator 1 from the University of Botswana explained that she, as well as change project coordinator 2, had experience in relation to those terms and ESD in general. Indeed, change project coordinator 1 explained that she had written her PhD in Environmental Education at Rhodes University and as such was really familiar with those concepts.

In regards to the notion of agency, change project coordinators in both institutions expressed the notion that the concept in practice should be centered on the students and give practical examples as to how action can be implemented. Coordinators at the University of Botswana further explained that for them, the notion of agency also included the element of critical thinking. For both coordinators, enabling the students to navigate between the different approaches and discourses around a particular topic was a way to foster what they understood as “agency”. When relating to how change project coordinator 2 was attempting to infuse the notion of agency in the classroom, he expressed:

“My main focus is that we have students who are critical thinkers, students that are able to construct their own knowledge. They have to appreciate that there are different sources of knowledge out there. It is not necessary for them to embed that knowledge without thinking about it.”

With respect to the other core concept from the ESSA program, strong sustainability, the responses received from the different change project coordinators were more homogenous. Indeed, in both institutions, the change project coordinating teams articulated the notion that they attempted to foster, in their teaching, the idea that all social and economic development where to occur within ecological limits.

The degree to which the ESSA publication “The Parts and The Whole” was used also informs on the capacity of the group to make use of knowledge and resources available. Overall, there is a rather ‘sporadic’ evidence that teacher educators are using and adapting the ESSA approaches and modules in The Parts and the Whole manual to their teaching. In relation to MCE and UoB, there is a great disparity between the two institutions. Indeed, when asked about the way in which the ESSA publication had been used in the development of the project, one member of the Molepolole college of Education explains:

“We have not exploited it that much because I think if you look at the [our project] itself, it almost resembles The Parts and The Whole. But … we should disseminate and print more copies for the different departments”
Here, the change project coordinator relate to the ESD manual developed by the change project team and which aims to mainstream ESD in the teaching practices of the institution. In contrast, both change projects coordinators at the University of Botswana claimed that the ESSA publication helped them in their teaching and was used as a resource during their classes (see annex 6),

5.4.2 Institutional environment
According to the theory of change the wider institutional environment in which the change project is situated will also affect how it will be implemented. Data extracted from the focus groups and interviews with the change projects coordinators enabled to identify three contextual drivers that have impacted the considered change projects: the organizational environment of the teacher education institution, the institutional environment of the Ministry of Education and Skills and the environmental education policies that have been implemented in 1994.

The Colleges of Education and the University are structured differently. At the Colleges of Education, the change project members are situated just under the principals’ office and involve only heads of department. Their capacity to create change in curriculum therefore seems rather great as they would only require the principal’s approval in order to instill any major change. At the University, the institutional context is quite different. Indeed, in order to create a major change in teaching and learning processes, the proposal is required to get approval from a wide list of different actors: from the department board, the faculty board, the advisory board, the school of Graduate Studies board, the academic planning committee and finally the Senate. Creating major changes in such environment will be more time consuming and more complex. Considering the situation in both institutions there seems to be a paradox: at the college of education with a simple structure it is difficult to implement a change project. In contrast, it is being done at the university, which has a complex structure. Could it be that the complex structure of the university allows its staff greater autonomy in their own classroom, while the simple structure of the college of education make strict control by the head of the institution possible and therefore limits the autonomy of the teacher educators?

Interviews with change project coordinators at the university highlight how they have developed their projects as to not go through what change project coordinator 2 relate as “administrative red tape” (see annex 6). The capacity of the change project coordinators to understand this institutional environment and to adapt the complexity of the project accordingly has, without a doubt, affected to way in which the project itself was articulated. Both change project coordinators at the University explained that they had adapted their current change project to the administrative limits imposed by their institutions. In the case of change project coordinator 2 at the University of Botswana, he explained how his change project was adapted to the university’s teaching and learning policy:

“UB has a learning and teaching policy and this learning policy is very flexible and accommodating of the things that one might try to bring about. What I have actually done is to try and infuse the change project, taking advantage of the existing statutes. Like the teaching and learning policy of 2008 as well as the graduate attributes which, incidentally, also have linkages with sustainable development”

The Ministry of Education and Skills influenced the way the different change projects were articulated and implemented. Indeed, the Department of Teacher Training and Development supports the development of change projects through funding and also sponsors teachers and lecturers to attend workshops and conferences relating to the development of their change
projects and ESD in general.

The need for implementation is, however, not felt by everybody. Exchanges with education officer 1 at the ministry enabled to receive a deeper understanding of the debate surrounding ESD infusion in the curriculum of teacher trainers (see annex 9).

“Discussing ESD in the teacher curricula is easy BUT the infusion and/or integration is not an easy thing. There is still some resistance despite the fact that teacher trainers see and understand the concept and the importance of issues on sustainable development... some still feel this is not anything of urgency and thus can wait or rather it’s going to overload their programs and thus affect program delivery”

Here, she explains that the while there might be consensus on the need for change, understanding of the concept of infusion was a barrier to further work towards the mainstreaming of ESD. This important point might also be behind the reason why most of the change projects did not seek to infuse changes in curriculum but instead focused on “physical” projects.

One last influence on the ways the different change project coordinators have developed their change project is the 1994 document developed by the National Education Commission. The commission introduced for the first time the necessity to teach and infuse its school curricula with the concept of Environmental Education (Republic of Botswana, 1994). Both change projects coordinators at the University of Botswana mentioned this document in relation to the way in which they formulated their project. Interestingly, no recent national policy or work was mentioned. During the interview both coordinators referred to the document as a way to justify their own approach in their change project, but also as a way to explain the shortcomings that other change project had in relation to ESD infusion.

“If you look at the background in that project, in 1994, when [the government] said that EE should be infused, there has been a problem with the actual teachers, who don’t seem to grasp the concept of EE. […] Then in our current National Environmental Strategy, which we develop with the ministry of Education, we are really bringing the concept of ESD infusion. Recommendation 44 says that ESD should become infused across the curriculum, [but teacher trainers] do not understand the concept, they see it as activity, as another subject. But no, these issues are cross cutting, you know. You can find opportunities in every subject, to infuse those, to mainstream those”

In this quote from change project coordinator 1, she explains how, unlike, the majority of change project, her project seeks to work towards the infusion of ESD in the curriculum of teacher students. Importantly, she refers that there seems to be a mis-understanding not only of ESD, but of the concept of infusion itself.

5.4.3 The wider environment
The Theory of Change explains that any type of change will occur within a socio-economic and cultural context that will inadvertently interact and define the way a given change will evolve over time. In regards to the present research, this means that the local, national and regional context as identified in chapter 2 and 3 will affect the way ESD is understood. Issues of unemployment, the spread of HIV/AIDS, local economic issues, urbanization, and Basarwa delocalization are some of the elements that were mentioned during the interviews with students and change project coordinators. Importantly, the question of the relevance of
education to address wider socio-economic issues will inform the way in which the infusion of ESD in curriculum will be understood. Indeed, if ESD is going to be relevant in the wider context that we identified earlier, teacher educators should address those issues in their teaching practice.

It was observed that some of these projects focused on “practical” elements of the institutions’ environment for two reasons. First, The wider dialogue that emerged out of the different focus groups with the change project teams appeared to perceive ESD at the crossing point between poverty and environmental risk. ESD is seen as a system for enabling learners to better adapt and act within their communities in regards to a set of identified local issues. It is therefore no surprise to observe that some change project focused on water conservation issues and waste management, as those are important elements of their everyday reality. Secondly, it was noted by different coordinators that an education officer at the ministry was influencing the way in which change project were meant to be. Field notes and discussion with different change project coordinators enable to understand that for her, it was assumed that, if more funding towards the schools was to be delivered, it was to be for the development of physical projects who would contribute to the overall management of resource at the institution. In this way, the different change project teams were also influenced by the way in which the ministry itself conceptualized what ESD change projects should focus on.

The lack in seeing education in addressing wider social or environmental issues shows the struggle that teacher educators have in relation to linking the school curriculum with local “sustainability” issues. It explains also why certain institutions did not think to integrate the notions of competencies and skills in their change projects.

5.4.4 Conclusion
This part has sought to provide some answers to the second research question: To what extent and how have the change projects initiated by the Botswana teacher education colleges that attended the cluster workshops of 2013, and who had for initial focus the infusion of ESD principles, achieved their objectives?

Using the lens of the theory of change, this part has identified a wide range of elements that affect the ways in which a project is first formulated and then implemented. The data show that different elements within the change project team (dissonances, agency, ownership, ability to plan) but also from the wider institutional context (organizational, administrative, policy) influence the way in which the different change projects are being implemented in Botswana. The above analysis has also enabled to identify different elements that can guide towards developing an understanding of how ESD is being understood in the different institutions and explaining why this might have been the case.

The occurrence of certain themes in the data suggests that there is an association between the degree to which a change project team understood the concepts of the ESSA program and their ability to implement the desired change project. In the case of the University of Botswana, both change project coordinators had a strong understanding of the concepts of ESD, strong sustainability and agency. They displayed a heightened sense of their own agency to adapt curriculum, teaching material and assessment tools accordingly.

In relation to this, two elements emerged as crucial in promoting the infusion of ESD in teacher education institutions: the support the change project group received from their
institutional environment and their ability to formulate a strategy to implement the said change project. Figure 10 outlines the crucial elements that determined the ways in which “ESD infusion” resulted from the different change projects.

5.5 Reflections and Recommendations

5.5.1 Towards a model
Taken together, figure 10 and 11 developed above enable to construct a model to understand how three crucial elements affect the development of change projects seeking at infusing ESD in the curriculum of teacher educators in Botswana. Figure 12 below explains how the understanding that a change project team has with respect to ESD learning processes, in connection with its capacity to strategically implement the aims of the change projects and with respect to the support it receives from the wider institutional context (administrative and ministerial) are crucial elements that influence the infusion of ESD in teacher education curriculum in Botswana.
The limited amount of data enabled to draw connections between the three elements pertaining to the infusion of ESD in teacher curriculums. Indeed, it was observed that the extent to which but also the way in which the change project coordinators understood ESD had an impact on their ability to effectively make use of the support they received from their institutions and their ability to formulate a project seeking to infuse ESD in teaching and learning practices.

5.5.2 Utility of the evaluative framework

The considered evaluative framework enabled two important elements. First, the nature of the different theoretical construct enabled to approach the multidimensional nature of ESD. Indeed, the theory of human capability together with the theory of social learning and the theory of transformative learning helped me understand how democratic processes developed in the classroom were a way to foster agency in the learners and create assessments that is relevant to the local context. The theory of social learning enabled to understand how certain pedagogies, and more exactly group processes, were a way for students to change their frames of reference and reflexively accommodate the views of their peers. The use of the theory of transformative learning helped identify a set of learning practices that are meant to transform the way in which teacher students understand sustainability issues. Second, the evaluative framework also enabled to relate the way in which ESD is understood to local and national context. As such, it proved to be flexible and adapts to the knowledge, skills and understandings that are relevant to the cultural and social reality of a place.

The above model needs however to be approached carefully as it will inherently hold weaknesses. The combination of the theory of change with the theory of human capability, the theory of social learning and the theory of transformative learning together can present some limitations. One crucial drawback is the complexity that is inherent to the structure of the model. Indeed, while combining the four theoretical concepts together is a way to cast a large net in regards to understanding how ESD infusion can be fostered, it also embeds so many different themes and elements that it makes it difficult to handle. While the four theoretical constructs have common and overlapping themes, certain concepts within the different theories can be rather similar. Whereas this overlap can be a strength for the model, it is also a shortcoming as it fails to use each theoretical construct to the fullest. Two theoretical construct that were overlapping is the theory of social learning and the theory of transformative learning. As was discussed earlier, the transformed understanding that occurs, within the context of sustainability, and through group processes, has been qualified as “transformative social learning” (Wals, 2010). As such, it was difficult in certain instances to differentiate between the two theories as they focused on rather similar learning process.

As such, and if this evaluative framework is to be used in further research, it would be appropriate to not incorporate the theory of social learning. Indeed, participatory group process being the principal elements that this theoretical construct focuses on, the fact that the theory of transformative learning also accounts for such process makes the former irrelevant.

5.5.3 Recommendations

Based on the model displayed in figure 12 and in regards to the different Botswana institutions I visited during the data collection trip in Botswana, I developed a list of recommendation tailored to each institution. The recommendations seek to enhance the
capacity of the change project group to further address the issue of ESD infusion in the curriculum. 
Due to their extended length, individual change project recommendations are included in annex 10. Here below I provide a more concise list of recommendation to address the shortcomings identified in the analysis and discussion above.

Based on the following query: How can we strengthen the development of change projects in Botswana? I have outlined a list of important elements that are thought to further develop the capacity of change project coordinators to implement change in their institution:

1. Focus on capacity development for the institutions that do not fully grasp the concept of ESD. Focus on the role of education as instrumental in promoting sustainable lifestyle choices but also as a manner to convey and enable the learner to critically reflect on the long term effect of one’s choices, negotiate alternative decisions and act in an empowered and responsible way.
2. Help certain institutions to reorient change projects to bring in the original educational component; and help others to bring it further.
3. Ensure stronger interaction and communication between the different institutions, the university and the ministry in order to ensure that no institution is left behind.
4. Let change project teams know that they are supported and encouraged at institutional level to infuse and mainstream ESD in their curriculum.

Therefore, it was suggested that a national workshop gathering all change project teams, institutional heads and relevant actors from the ministry of education and skills, department of teacher training and development would help to achieve the above elements. Focus on the educational part of ESD and on planning tools for change project management that inform and support change project groups was thought to be relevant. In regards to the former, developing discussion about the concept of ESD1 and ESD2, and how those notions can be fostered in teacher educators’ daily practice would provide grounds for a wider understanding of education for sustainable development. In regards to the latter, it was thought that supporting institutions in developing a theory of change would enable to develop implementation capacity in their institutions.
6. Conclusion

As explained by the quote by Schumacher on page 1: “The volume of education has increased and continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes us into the depth of things’ (Schumacher, 1974). This present research thesis has attempted at providing further clues as to the kind of education that would enable learners to address those sustainability issues. In this study, I have looked at how teacher educators in Botswana have approached and implemented change projects aimed at infusing ESD in their practices.

This present thesis approached the topic of ESD infusion in Botswana teacher education curriculum in two ways: in a descriptive (how?) but also investigative (why?) form. More precisely, it used this approach to examine the different elements that affect the development of infusion and mainstreaming of environmental and sustainability education in six teacher education institutions in Botswana. Chapter 1 and 2 enabled to develop a greater understanding of the different conceptual attributes that have been shaping this study. They describe both the environmental, socio-economic and political context and the different international and regional forces that have been affecting the way ESD has been understood in Botswana. Chapter 4 describes the theoretical lens with which I have used to evaluate the way in which ESD has been infused in the teacher education institutions. Chapter 5 describes the overall taken by this research. It outlines how the case study approach enabled me to gather relevant data to answer the research questions presented in the introduction. In the final part, I discuss how the collection, analysis and interpretation of the data enabled the identification of a series of crucial elements that (1) promoted the implementation of transformative teaching processes, and that (2) were decisive for the change project group to create the intended change.

The findings of this study enabled me to answer research question 1 and 2 outlined in the introduction. In doing so, this research helped to identify two important elements:

- A transformed understanding of sustainability issues on behalf of pre-service teachers is determined by the ability of the teacher educator to understand and relate to the different notions and approaches inherent to the concept of ESD and to understand what kinds of teaching processes have an effect on transforming mental models.
- The extent to which ESD will be infused in the curriculum of pre-service teacher is determined by the support received by the wider institutional context and the ability of the educational institutions to strategically implement such a process.

Those elements showed to be essential if ESD is to be further infused in teacher education institutions in Botswana. There are, however, many ways in which the frame developed for this study can be improved and be more relevant in helping institution to infuse ESD. Indeed, given its size, the combination of the four theoretical framework created a tool that is rather complex and is therefore demanding on behalf of the researcher in regards to data analysis and interpretation. In a bid to make this tool less problematic while keeping its relevance in addressing the multi-dimensional nature of ESD, it was believe that the theory of social learning could be removed from the present frame as its overlap was significant with the theory of transformative learning.

In a bid to make education more relevant and of quality, it is important to realize that the notion of ESD itself needs to be articulated in such a way as to make education relevant to local realities. And it needs to do so by addressing environmental and social issues using
cultural and traditional forms of knowledge in the process of doing so. Therefore, a further step for this research would be to strengthen the theoretical frame developed here in enabling it to further understand how culturally relevant teaching practices can be embedded.
7. Acknowledgements

I would like to thank my parents for their constant support during the writing of this research project. My thanks also extend to my wider family of fellow MSDs who have made this whole program an enriching experience.

I am extremely thankful to SWEDESD for enabling me to carry out the present research. And I am especially thankful for the new friends I have made during my internship in Gotland.

I would like to express my deep gratitude to Dr. M.J. Kethicalwe, Dr. Ntah Silo and Dr. Keen Boikhutso at the University of Botswana and Dr. Spar Mathews at the Ministry of Education and Skills for their passion for environmental education and for their kind help and hospitality during my time in Botswana.

Thank you to my sambo Anja for your affectionate support and unconditional love.

Finally, this master research thesis would not be what it is today without the relentless contributions, thoughts and reflection from my supervisor Frans Lenglet. I am extremely thankful for the inspiration and motivation that you provided.
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Annexes

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Annexe 1: Consent to Participate in Focus Group

You have been asked to participate in a focus group sponsored by Uppsala University and the Swedish International Centre of Education for Sustainable Development. The purpose of the group is to try and understand your learning experiences over the course of the last few months. The information learned in the focus groups will be used to identify how students feel regarding the course they are taking and how it could be further improved.

You can choose whether or not to participate in the focus group and stop at any time. Although the focus group will be tape recorded, your responses will remain anonymous and no names will be mentioned in the report. There are no right or wrong answers to the focus group questions.

We want to hear many different viewpoints and would like to hear from everyone. We hope you can be honest even when your responses may not be in agreement with the rest of the group. In respect for each other, we ask that only one individual speak at a time in the group and that responses made by all participants be kept confidential.

I understand this information and agree to participate fully under the conditions stated above:

Signed: __________________________________________ Date: _____________________
Annexe 2: Interview Questions

**For the Students of the course** (focus group max. 60mins)

*To what extent did the course contribute to a transformed understanding of sustainability issues in teacher education in Botswana? And how important was participation and social learning in the course?*

**Open question:** Has there been something special happening? New experiences? Has the course, in recent months brought up something new?
To what extent did you experience something new in the course?

What concerns have been brought up in the course? Are these concerns discussed? To what extent did you learn about your own concerns? And about the concerns of other participants?

To what extent did participating alter your own concerns regarding Sustainability problems in Botswana?

To what extent did participating help you see topics in which you agree or disagree with others?
To what extent do you have different concerned regarding the environment? Social problems?

Which actions have you identified to address these concerns? How do you see going from here? Have you thought about certain actions?

Focus on opportunities and constraints: what new resources do you need? What would like to change to give yourself more room?

What aspects of the course would you like to change? How would you make the course more relevant? More effective? More exciting?

**For the Change Project Team** (focus groups max. 90 mins)

*How well have the change projects initiated by the teacher colleges been implemented in the curriculum of teacher education institutions in Botswana?*

Can you briefly outline the focus of the change project, what does it want to achieve and what are the objectives?
Have things changed? was it the same as originally set out?

What changes in practice or capacities do you expect to see? What were the original intentions? And thus have you seen some changes?

--Identify clear intentions--

The workshop that you attended created an opportunity for the creation of the change project.
How did the discussion evolve since then?

How have you worked with others at the institution and is it important?

Have the Gaborone Guidelines for change project implementation been useful when designing and implementing the change project? —for UoB only—ASK MJ: have they been shared around? has anybody seen this guidelines?

What has been working? How do you see ESD in your institution? Is there a change?
What do you think has not been working so well with regards to the development of the capacity of the institution to embed ESD in the curriculum?

How can further support help the development of the change project? What kind of help would be useful for the change project to go forward?

Has the ESSA programme been able to develop capacity in teacher educators?

What do you feel are the most important knowledge, understandings, skills or values for the students enrolled in the program to learn?

Having attended the ESSA workshop, you have learned about the 2 important notions of the program: Sustainability and Agency. Where those notions clear for you then? Are they more clear now?

How do you try to bring those two notions into the curriculum of teacher students?

To what extent can it be said that the change project addresses the issue of sustainability?

What were the most important elements that you took away from the workshop? How did you implement it into the classroom?
For the Ministry of education and skills

*How is the Ministry of Education and skills and the wider political context in Botswana supporting the development of change projects in teacher education institutions.*

What do you perceive is the role of the Ministry in supporting the implementation of ESD in the curriculum of teacher education institutions?

Are there plans? schedules? monitoring? feedback? lecture material?

Is it easy to discuss the implementation of ESD in teacher curricula? Is there conflict, debate or consensus on the need for change? Does everybody think the same?

Have these change projects, or the learning from the ESSA program become part of the national strategy on ESD?
Annexe 3: Focus group Grounds rules

FOCUS GROUP INTRODUCTION WELCOME
Thanks for agreeing to be part of the focus group. We appreciate your willingness to participate.

INTRODUCTIONS
Moderator: Jesse Schrage, background and past experiences.

PURPOSE OF FOCUS GROUPS
I have been asked by Uppsala University to conduct the focus groups. The reason we are having this focus groups today is to find out how the change project has been evolving since it started in 2013. We need your input and want you to share your honest and open thoughts with us.

I am interested in the processes of how these change project are implemented and my research will inform the coordinators of the ESSA program on the current situation.

For the next hour, we will have a focus group where I would like to discuss some matters regarding the course, regarding the way you (the change project team) have worked together to develop the change project.

It is really important that we establish some rules, or the conditions that will make this an easy experience.

GROUND RULES
1. WE WANT YOU TO DO THE TALKING. We would like everyone to participate. I may call on you if I haven't heard from you in a while.

2. THERE ARE NO RIGHT OR WRONG ANSWERS. Every person's experiences and opinions are important. Speak up whether you agree or disagree. We want to hear a wide range of opinions.

3. WHAT IS SAID IN THIS ROOM STAYS HERE. We want folks to feel comfortable sharing when sensitive issues come up.

4. WE WILL BE TAPE RECORDING THE GROUP. We want to capture everything you have to say. We don't identify anyone by name in our report. You will remain anonymous.
### Annexe 4: Document analysis: Term paper topics

<table>
<thead>
<tr>
<th>Theme</th>
<th>Quote</th>
<th>Source</th>
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<tbody>
<tr>
<td>“Digging for meaning”</td>
<td>“Forced relocation of the Baswara from CKGR: an example of killing and non-killing society”</td>
<td>Change project coordinator 2 at UoB</td>
</tr>
<tr>
<td></td>
<td>“Bushmen and Modernity: Understanding the forced relocation of the San from CKGR”</td>
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<td></td>
<td>“forced removal of the Baswara from the CKGR: Implications of the 2004 court case”</td>
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<td></td>
<td>“The relocation of the San from the CKGR: the untold story of the forced evictions”</td>
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<td></td>
<td>“The relocation of the San from the CKGR: A classic case of socio-economic abnd cultural massacre”</td>
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<tr>
<td></td>
<td>“Understanding the forced relocation of the Baswara from the CKGR: Where do we go after the 2006 High court landmark ruling”</td>
<td></td>
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### Theme: Relevance of Education

<table>
<thead>
<tr>
<th>Quote from participant</th>
<th>Data source</th>
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</thead>
<tbody>
<tr>
<td>“It taught me so much about Botswana’s resources and their current state, things that I feel I would have not known or become interested in, had I not taken this course”</td>
<td>student evaluation of course and teaching: 4th year course EPI 442</td>
</tr>
<tr>
<td>“I liked learning about indigenous knowledge and how it can be used to conserve natural resources”</td>
<td></td>
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<tr>
<td>“it applies to our everyday lifestyles”</td>
<td></td>
</tr>
<tr>
<td>“Most of the topics are real life information based”</td>
<td></td>
</tr>
<tr>
<td>“the course provided me with the significance of indigenous knowledge in children learning and why conservation education is important to the learning of children as well as the community”</td>
<td></td>
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<tr>
<td>“The course empowered me to evaluate both the indigenous knowledge and scientific knowledge and never take any for granted”</td>
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<tr>
<td>“It really made me appreciate my country and its natural resources, as well to be irritated about conservation of the environment”</td>
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<tr>
<td>“indigenous knowledge is very important and we have to incorporate it with the one that we gain here”</td>
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</table>

### Theme: Agency

<table>
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<tr>
<th>Quote from participant</th>
<th>Data source</th>
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<tr>
<td>“The course empowered me to evaluate both the indigenous knowledge and scientific knowledge and never take any for granted”</td>
<td>student evaluation of course and teaching: 4th year course EPI 442</td>
</tr>
<tr>
<td>“the course has broaden my scope on how to solve problems/issues of the environment”</td>
<td></td>
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<tr>
<td>“It has been an eye opener to me as I am now aware of environmental issues and have ideas on how to deal with those issues’</td>
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<tr>
<td>“This course developed me professionally and served me as an eye opener on environmental issues. I feel I am a responsible citizen because of it”</td>
<td>Student evaluation: 3rd year EPI 335</td>
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</table>
“the course has helped me a lot on issues of evaluation and monitoring my world. This was an eye opener for me”

“And you know, what we learn we are going to infuse it into our curriculum!”

| Learning for action | “The use of the field trips quiet influence the way we think, we have managed to move from one area to the other, we have changed, like we have gone out for an inspection. When we were talking about bore-hole water conservation, we went out, we were able to see how things are done, how water is conserved. That had on its own created a great differences in us because otherwise what we used to hear is that water could be conserved but we had never seen before. So I think that the way we are learning is influencing to change our lifestyle and change the way we are thinking and to share things with other people.”

“It has been changing our attitudes towards the environment. Even our behaviours, where we’re practicing things differently compared to how we used to do in the past. Because we now know that there is a need for conservation”

“We took a trip to Sese village with our lecturer last semester and there was some projects there about water conservation. They dug and put concrete and some pipes in the catchment area. So we learned about that and the process and she told us what we were going to do when we get to the schools. When we will go out to our work are, we are thinking of doing similar there. Our teacher always asks us what we are trying to implement in the schools”

“We just don’t talk about things in an abstract way, but we talk about things that are happening around us and then we think of ways of coming up with solutions and we are learning for our various environment, what it is we can do to address these issues” |

| Democratic Dialogue | “this semester [we] had more debates and having our say on issues that are pertaining to sustainable development: on issues like the environment, the Nile river,…as compared to us being taught in the lecture rooms”

“Yes, similar feelings and different opinions as well and we have been able to learn from one another because we view things differently”

“I personally like debates and when I hold onto something I believe and we re aiming to beat. It is wonderful to hear somebody saying their views. For example we were talking about the story of the forced
relocation of the Baswara people from their area. So we were arguing about it. Some people were for the Baswara saying that they are supposed to stick where they are and live in their environment. And I was saying that they also have to go out and enjoy the modern life, go to school. As their were talking there was a girl that mentioned an important point and said that the curriculum doesn’t suit them…it made me realize that is not about all what I think. So it helps a lot.”

“Yeah, like she already said It is very important that we raise our own views. And I think that we are given chances to raise our own views. We did a course on nation building and we were given an assignment on the removal of the Baswara people from the game reserve. And the government forcibly removed them. The government kept quiet about it, and said that they agreed to it. But only to find that these guys were forcibly removed, that they don’t want to move the CKGR. So in class yes we are able to raise our own views, saying “no the government didn’t do right there!”.

“When we have different views about something, we usually come up with evidence to say “mine is actually better than yours, let look at something concrete” so that we all have something that we can rely on, something really concrete so that we can decide to choose your view rather than mine”

“It’s never easy to say that you are wrong. It is difficult to say, yes you are right, but you have to say it when looking at the evidence provided, concrete evidence about your views. At the end of the day, it is difficult, but you have to look at the evidence that she has when it is better”

“Yeah, like she already said It is very important that we raise our own views. And I think that we are given chances to raise our own views. We did a course on nation building and we were given an assignment on the removal of the Baswara people from the game reserve. And the government forcibly removed them. The government kept quiet about it, and said that they agreed to it. But only to find that these guys were forcibly removed, that they don’t want to move the CKGR. So in class yes we are able to raise our own views, saying “no the government didn’t do right there!”.

“I think the approach is more learner centered than teacher lecturer. They are more presentations and we have more time to research and discuss issue. We do a lot of debates and so on”

“This kind of discussion really makes learning interactive and interesting. We tend to remember what we talked about and what we did discussed in the class than when we are being told by the lecturers, it is also developing us professionally. It develop our skills and we learn how to discuss and to advocate what is important for us.”

“This course has been an eye opener for us, we can think beyond conserving the environment and we now know how to take care of the environment and we have got now the knowledge of how we can consult other who are not familiar with conservation and respecting the environment.”

“Also it has happened that we should know how to relate with the living things. Because those are the things that we depend on, even those things that depend on us. It is centered on our attitude to the environment in general, the way we use to value the environment like for instance our practices, we used pen and papers and we didn’t know that these things pollutes the environment but with this course it is really opened our minds.”
“We use to shun our indigenous knowledge as soon as we enter this education, But now we have learned that it is really important and we can use it to sustain our environment”

we were really concerned, we saw that this was wrong, because we got to see that this is not a story that we got to hear. We were told something else but when we got to read the papers and see the Baswara pictures, seeing the torture, with their parents asking for help, we get to realize that this is not the picture that you are not given, it is a different story. And we really missed out on a lot, we got to know about it now. I think that at times we have been mislead by the government and we have been told that it is something to appease us, in the rest of Botswana and it’s not really good. Because we get to find out the truth, you get to realize that it is not a truthful government, these are not good leaders. You can’t even trust them, they don’t have honest.

**Learning at different scales**

“Especially looking at the issues that are there in our country, the water shortages, the cars that are coming from South Africa and from Japan, they are all around and we have been discussing this in our classes. It really needed”

**Collaborative Learning**

“I think [learning in groups] was important because we learned from one another and we appreciated the other’s ideas and we could see that we share the same sentiments. But we end up coming to one agreement. We learned how to cooperate and incorporate our ideas as well.”

**Barriers to change**

“Sometimes when you look at personal views but we can’t really express our own views because we might be scared to say something that is against the government, to say that it was wrong to remove these people from CKGR. I did raise this point, but my lecturer said that “yes, this is your point of view, but let’s keep on going with the course”. You know, because I was raising my own point of view. We are not really able to raise them”

“Okay, I personally haven’t because it is a sensitive issue because the government is involved. So when you come to think of me as an individual, and the government has money and all those big lawyers, so what are we going to do about it? I’ll think ok fine so I think let me leave it to those people that are important and there were those people that were involved in defending the Baswara. So let me leave it to those people and just back off a bit.”

There needs to be someone to come up with solutions and act on them. Looking at the issue of the SRC, they are not really at ease. I would want to run for the elections one day to become president but looking at recent issues of how presidents have been dismissed or forced to leave school because they have raised their own opinions or their own views. In the way that we are raised, we are raised that we can’t really say much to an adult. You always have to listen to what an adult says, and if you say something against what an adult
says, you are considered disrespectful. You have to behave, you can’t tell everything you want. If she says do that, you have to say “yes m’am” and you can’t ask why”

“Sometime when a teacher would have said something, and he or she goes up and goes back against her word and said “But you said that ..” and the teacher would answer, “are you saying that I am lying” …so you can’t say yes to that ! It is a sign of disrespect, so we just have to disrespect what they are saying. The promises that they give us and they never fulfill so…”

As long as action is undertaken against those people, there will be people that will stand up against the government. Then we as the following …..are going to stand up like the SRC. Every time when there is an issue of, when they do something that actually pushes the government. And when they do that they are actually suspended from school. As whenever as the students of UB act, when you that that happens, you cannot stand up and be in leadership because we don’t want to be suspended because we have families that we come from and a reputation to uphold. So when we think about those issues and we just sit back because there is nothing else that we can do. For now I don’t really see the situation changing anytime soon, it will take a while for institutions to change. Maybe 10 to 15 years …I just wonder!
### Annexe 6: Themes expressed by Change Project coordinator at the university of Botswana

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<thead>
<tr>
<th>Theme</th>
<th>Response from the participant</th>
<th>Data Source</th>
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<tbody>
<tr>
<td>Understanding of the wider policy context</td>
<td>“Respondent: Initially, when we were in Swaziland, my concern is if you look at the background in that project, in 1994, when they said that EE should be infused, there has been a problem of the actual teachers, who don’t seem to grasp the concept of EE. The emphasis then was on environmental education, and then in our current National environmental strategy, which we develop with the ministry of Education, we are really bringing in this ESD, the concept of ESD infusion, and with our interaction with our teachers we train for primary education. […] So my complaint in my department is that recommendation 44 says that environmental education should become infused across, and then how does teachers as we interact with them, they do not understand the concept, they see it as activity, as another subject. But no, these issues are cross cutting, you know. You can find opportunities in every subject, to infuse those, to mainstream those”</td>
<td>UoB CP coordinator 1</td>
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<tr>
<td>Influence to the cp</td>
<td>“Their worry is that because they want to focus on curriculum subjects which are in the curriculum: English, Math, Science… you see? All of those. For environmental education, they feel that if they don’t have space, why should they bring it in? It is just like I get student that come out of interest, and I am not happy about that because I feel that all of them should be included. If they have to fulfill what the policy demands, the recommendations, to infuse, and you will see the policies have in mind said that it should not come as an additional subject but should be infused in these different subjects”</td>
<td>UoB CP coordinator 2</td>
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<tr>
<td>Institutional context opportunitny</td>
<td>“I actually have teachers at my disposal that come, I can have more than a hundred teacher that can come. So why not then get an opportunity to make a proposal to the department that all the students could take my course as a element of ESD. Why not take those students and use, make a change, take some component from the parts and the whole and build them into my courses and carry them through it. That is what I did. It is a good thing here at university that we can be pretty flexible. And that was useful. So I use the sustainability matrix, without really telling students about the parts and the whole, I was taking information”</td>
<td>UoB CP coordinator 1</td>
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Well I wouldn’t say that it has been working as well as in the colleges of education. With the university, in our case, I think that there is this element of independence. To really try to coordinate people is not easy here, it is a different setting here. But it is those small connections, networks, where I feel that can feed into my work, and we can collaborate. We have a lot of students and the lady I talked about is the one that helps me.

I have tried to bring the course outline to reflect the expectations, national expectations, UB expectations as well as the expectations of the learners. I have tried to also anchor. Because I said, here at UB, if you have to undertake minor revisions to the course, you have to go through a lot of rating, it is a long process. Starting from the unions through to the department, the faculty, faculty executives…it is a major review. And ultimately go to the senate. So I have tried to say “how can I operate without going through this process”. UB has a learning and teaching policy and this learning policy is very flexible and accommodating of the things that one might try to bring about. What I have actually done is to try and infuse the change project, taking advantage of the existing statutes. Like the teaching and learning policy of 2008 as well as the graduate attributes which, incidentally, also have linkages with sustainable development.

Institutional context

Challenges

here, unlike to colleges, we are responding to the politics of higher education institutions. When I started, I talked about the fact that there are 2 processes in terms of the teaching and learning processes. Some of the changes are classified as minor and others as major. And if its major, you have to start initiate the change and you need buy in from your colleagues, and you also need buy in from the department, and need buy in from the faculty and it is not easy because people have different theoretical perspectives. It will be suicidal to say that we would come up with a project that is going to make a difference. It has work through this bureaucratic red tape and it is just a question of appreciating the limitations and the constraints that we are working in. In the colleges, you are talking about a situation where the principal, maybe a staff of 14, then with the heads of departments…. Whereas our structure here is slightly different. The head of department is here for a two term contract, 5 years-5 years, maximum 10 years. The same things happens with the Dean, they also have a 2 term contract, 5years-5years. Beyond that, he has to go, the vice chancellor also is on a fixed contract. So there are so many changes, it moves, it may not be realistic to come up with a change project that can be broad based for the colleges…[…]We are trying to be adaptive to the realities of higher education, maybe this explains the variation between how we are doing this and what the colleges are doing. But you find that the distance between us and the colleges is not great. We try to make this less and I think that somehow I am seeing that since we cannot make a difference that is substantial in UB, we can exert our influence in the colleges, we can bring it there.

Financial constraints

“There was a time we wanted make a proposal with MJ and General for some funding to come up with some which could address some of this issues, to develop material and so forth but we are in the process. But our university is pretty complex, why I wanted to develop material, to get some of my colleague’s input from their different subjects. It becomes complex because here there is so much independent work that is being carried out on their own subject so I was thinking of developing it for teachers, for the practicing teachers that are my students to develop that material, but that would take a long time in terms of resources
and so forth”

<p>| Agency | “So I then said, why not come up with a pre-service degree where we don’t service in service teachers coming from schools, but students who are finishing at high schools who apply at university. They will apply directly for a degree program. Without necessary going through the different colleges of education, they will be teachers also with a degree in primary education. So it is a new thing that we are working on, we need to work at lightning speed to develop the program so that we will be covering all the application and call for advertisement …and it will start in August! Last week we had a meeting, it appeared that we can’t meet the deadline because it has to go through different approvals: departmental, faculty board and up to ……so it will be for next year. So I said this is my opportunity, I am going to fight for being able to accommodate for all the students who come to our department to have one course, one general course and I succeeded in that. So we developed a new course for this program. This course, introduction to education for sustainable development, when they come in the first year, which will be three credits, which is the course I developed” | UoB CP coordinator 1 |
| Ask for help | And I think that you will appreciate that I am trying to prove the colleagues in the colleges and I think that what was embedded in my comments that as an individual you can make a difference. No matter how insignificant your contribution is, you can tell yourself that I want change, in your own space, that can be realized. I think that this change project seeks to do. It is to look for opportunities, you appreciate the challenges and you now think of new ways to deal with the old problems. | UoB CP coordinator 2 |
| Teach for change | “We have been running courses, in December, selected teachers and other practitioners in EE and then they go and do change projects in their schools. We have seen some really beautiful change projects where I usually bring my students. Some have really successful vegetable gardens and so forth. So I always say to my students, the change projects are really difficult in terms of collaboration and those issues…so I said, see the change you can do. So I normally gave them an assignment and say that the best change you can do is a change within what you have control over and what you can work with, with most cases, is in your schools. And I have found that primary school and doing better than secondary schools. Work with your children, start at the classroom level, see what the projects you can come up and involve the kids. Because those ones are always beautiful and are very receptive…start with your class!” | UoB CP coordinator 1 |
| Teaching at different levels | “So I have a course, there we look at problems in Botswana, they look at problems within the context of Botswana. These second year courses I have adapted where I look at it from a global perspective and they lead to the local perspectives. So we start from the local and then we bring in the global perspective and how the links are there. Yeah that is how we do it.” | UoB CP coordinator 1 |</p>
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<tr>
<th>Understanding of concept of related to project (ESD, SS)</th>
<th>“Yeah, it was the case that I was working with [ESD] before the workshop. And you know I was at Rhodes university, they are really good there in terms of these issues of ESD. And Heile-Lotz was my supervisor. She is very productive in this region.”</th>
<th>UoB CP coordinator 1</th>
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<td></td>
<td>“it was easy to understand [talking about the concept of strong sustainability]. So this publication came as a help, to feed into what I am doing.</td>
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<td></td>
<td>“You have all these issues and I really try to push for this holistic approach, looking from the political perspective and give examples from Botswana for example. When I do my test and assignments, use global examples. And look at how you can address these 4 components: social, economy, biophysical and political perspective. Issues of social justice, environmental justice and so forth. So that is the key of the course. It is good way to map out. And for any activity that we do, that is the approach that I emphasize”</td>
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<tr>
<td>Teaching for transformation</td>
<td>The values perspectives. That is what I try to build into my courses. There are different ways to look at issues, and it is only through a change of our value system that we can access it. And adapt it to simple things like resource consumption. We use day-to-day examples with our students. For example, we go into a room you see in our funerals, you are queuing and then there is food there. You go and then you see someone dishing all the food and you see some people behind you. And what does it mean for our consumption. Then our consumption patterns in terms of even resource you know: how many cell phones, coming from the parts and the whole, how many have you used in such and such a time. And how many do you own: how many TVs and all these things. It is really in terms of attitudes, our lifestyles, values, what our values are as a people</td>
<td>UoB CP coordinator 1</td>
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<tr>
<td>Teaching for action</td>
<td>If you are coming from the so called dominant groups, they have a story to tell and to protect. And without imposing ideas in them, you have to help to appreciate that there are 2 sides to the story. There is never only side, you have to look at the other side also. Sometimes I say to them: “would you rather take development to the people or people to development”. That has provided the baseline for my teaching.</td>
<td>UoB CP coordinator 2</td>
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<tr>
<td>How to bring project forward</td>
<td>“That could be the focus of the ESSA program: to look at the different change projects and how can we improve these change projects in terms of collaboration so that these project really can bring people together or achieve the objectives it is meant to achieve. I think is very crucial”</td>
<td>UoB CP coordinator 1</td>
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<td>Ownership</td>
<td>I have actually embraced the idea of a change project as well as education for sustainable development. So when I plan for my course, at the beginning of the semester, I am mindful of the need to be creative and be innovative because I believe that SS requires innovation. Because if you are not innovative, there is no way you can actually succeed in that regard</td>
<td>UoB CP coordinator 2</td>
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<td>Diversity of teaching methods</td>
<td>Now the other thing is that I have been using a blended approach whereby I am using traditional teaching methods as well as online teaching. At UB we have 2 online platforms here, the blackboard and the module. Initially my course was somewhere in the blackboard and somewhere on the module, and I decided to migrate my courses to the module which I think is more flexible. Now what happens is that most of my courses are 3 credits courses which means that they are 3 hours a week. Because of the blending of the traditional and the</td>
<td>UoB CP coordinator 2</td>
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Instead of having a common approach, give the students some form of space. There is the danger that we look at the solution in terms of the one size fits all, that there is a generic solution. As we move forward a workshop where we appreciate that the institutions in Botswana might be approaching the change projects, and maybe it is for the good. It might not be a dead thing itself. At the end of the day you don’t want to have homogenous students that would think alike, dream alike and act alike …I think I d be bored if I was living in this kind of environment.

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<th>Culturally relevant Assessment is built on notion of diversity of approaches to understand the issue at stake</th>
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<td>Now what I have done is to introduce a concept of a term paper. What does a term paper does? It is to identify a critical issue, like one of the course that I do here is a course in social studies and nation building and one fo the critical things is the so called of the Baswara from the central Kallahari game reserve to new settlements. That was a very topical issue because is even went to the high court and so on which is a landmark that we talked about for four years now. What I think is that we need to revisit events and together with the students if we could have perhaps done the relocation differently. So basically, what this term paper does, is to try and I am now trying to dictate to the learners but I am trying to get them into groups to see that here is an issue, (making reference to the document) and looking at issues and challenges</td>
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<th>Change in teaching practices</th>
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<td>After the workshop, this was in 2013, you can see that somehow in terms of the exam, I was gradually beginning to infuse the issues of strong sustainability, especially critical thinking. You look at the type of questions that I have there… If you look at question 2, it was also anchored in the term paper. They now think about what they have done through the research and the concepts. So this is what I have done. Maybe that was not good enough. In 2014, if you look at the last semester’s exam, you look at the way I have set my examination questions, it is totally radical. It is a different way to look at it, where I use some sort of a narrative. These narratives are from the research papers at the faculty. I don’t want to tack narratives form outside. I want to pick narratives from the lecturers that they know. Then what I do is to pick this narrative and ask some questions so that the idea is to have learners who move away from rattling so that they can now apply their knowledge.</td>
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<tr>
<th>Perceived Learning outcomes</th>
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<tr>
<td>My main focus is that we have students who are critical thinkers, students that are able to construct their own knowledge. They have to appreciate that there are different sources of knowledge out there. It is not necessary for them to embed those knowledge without thinking about it.</td>
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<tr>
<th>Collaborative/Group Learning</th>
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<tr>
<td>My emphasis is team work and cooperation. In the past I used to divide the students into groups but I have since stopped doing that and I just have my expectations and I tell them “ you are 40 in a class, and I need 8 groups of so many students per groups, and its up to you to decide on your own”. I m trying to actually stay in the sidelines so that they can get empowered</td>
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<td>Capacity Development from ESSA</td>
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<td>exposure to change project workshop, the parts and the whole, Brunner’s presentations, these were really good timing. I think that it matures us</td>
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<td>The workshops were very educative and I think that if I actually strengthened the need to try and have this sense of agency. Where you can appreciate the constraints while at the same time you can say that you are making a difference. The workshops were very educative, both in terms of being in peace with myself, being content and happy.</td>
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UoB CP coordinator 2
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<tr>
<th>Theme</th>
<th>Sub-theme</th>
<th>Quote or reflection from transcripts</th>
<th>Data Source</th>
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<tbody>
<tr>
<td>Teaching practices</td>
<td>Evaluation &amp; Pedagogy</td>
<td>&quot;Hum, for guidance and counseling it is more theoretical than it is practical, so basically you have the concept of what guidance and counseling is but you don’t really get into it and often you do the course and the lectures are done lecturing about it. Then you right the test and that’s done with guidance and counseling and you are going to move on to the test and measurements, all of that kind of stuff. But there are other students that are studying guidance and counseling.”</td>
<td>MCE 2nd Yr</td>
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<tr>
<td>Participation, learning about yourself and other values</td>
<td>“Absence of reflection about the issue. When asked about participatory practices, students answered”Wow, okay. Hum, wow, let me think about it for a second.”</td>
<td>MCE 2nd Yr</td>
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<td>Becoming aware of your own values</td>
<td>Statement of intent</td>
<td>“The statements of intent being sort of like “what are you proposing to do for that actual project that you are trying to initiate”. You are trying to look a whether you are going to create some social awareness or anything concerning things that are emerging like she was saying within the society. So you have to look at it at a more meaningful level, that just doing art for the sake of doing art. You have to do the research, you have to get deep, in depth, you have to address a certain problem within the society and highlight that within the project that you are doing in art”</td>
<td>MCE 2nd Yr</td>
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“But then to a certain extent, as much as there are some people that are tying to address some issues that may be affecting our environment or whatever the case may be, you’ll find that sometimes you resort to using materials that are around you because of convenience, or because of the fact that you may not have enough money to be able to buy certain things to be able to complete those particular project. Like he said earlier on, you spend close to nothing when you’re using materials that have been thrown away and you are re using them again to create this work of art. But then there are those that do see it as addressing a social issue and there are those that see it like an opportunity to cut down on costs.”

| Restricting factors | Authority | “I feel like that to a certain extent that as much as people may have problems within the school, they feel that if they say something, their school career could be in jeopardy to a certain extent. They feel like that if they voice out any issue they might have, they might not have schooling anymore or whatever the management may do.” | MCE 2nd Yr |
“On my project where I am using plastic bags, when I made it, I was thinking if I could make it like that, people that see it may think “okay so you can do something out of plastics” then they will start to maybe collect them around and clean the environment by doing so and create something that is different from what I have done. So I was thinking maybe that people see that it will create awareness if they see that art work, they’ll maybe come up with different art works and make their own art works.

“Indeed, I also had my own motives in terms of why I decided to use the various things that I did. But I’d always see these broken bottles pieces, all over the ground, and I am busy walking and wondering what I could use these for? And here comes this great opportunity to have this craft project where you can sort of create something out of nothing, you know? People take for granted the fact that you can take broken bottle pieces and use it to create something that is esthetically pleasing to the eye.”

“Yes i think people start the realize that they have opportunities lying around them, they should have that courage if they see our work, they’ll be encouraged to go and do something so that they can have an income at the end of the day.”
## Annexe 8: Themes expressed by the change project team at the Molepolole College of Education

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<tr>
<th>Themes</th>
<th>Sub-theme expressed by participant</th>
<th>Quote or Discussion theme</th>
<th>Data Source</th>
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<tbody>
<tr>
<td><strong>TOC</strong></td>
<td>Dissonances in understanding: Happiness, waste management, creating awareness, life long learning</td>
<td>Art, Counselling, Natural Sciences….different visions and ideas of how ESD should be embedded in the classroom.</td>
<td>MCE CP group</td>
</tr>
<tr>
<td><strong>Timeframe</strong></td>
<td>I understand that this is a ongoing project and I was wondering if there is a time limit to it. When we were producing the manual the initial one was 2013 and just this morning I changed it to 2013-2015 because I was wondering about the timeframe. When we will cascade to the rest of the departments, we have to see throughout the year the work on this and the updates. And after such and such a time we have a complete version that we are working on it.</td>
<td>MCE CP group</td>
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<td><strong>Mis(?)-Understanding of the concept: ESD objectives</strong></td>
<td>Environmental sustainability</td>
<td>The intention is to take care of the environment; to be in a position to manage our environment, take care of our environment to sustain what has been here before us. So if by chance it happen to look for foreign objects that are struck in our environment. If you collect and use them and recycle them, then we are also in the environment and make it a personal issue. It can be as natural as possible for the long term think that we are all aware that nowadays we are using fossil fuels in the form of energy resource. Yes, so here we are actually sensitizing the students to realize that this is the fuel that is actually bringing about this climate change and this rise of CO2 and CH4 gases. So we are basically trying to make students realize that when these resources are used they should be used with care, and take care of the ecosystem</td>
<td>MCE CP group</td>
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<tr>
<td><strong>Understanding of the concept ESSA_SS and agency</strong></td>
<td>if you look at the approach that we have adopted, we have really adopted the one of agency where we are now talking about the classroom pedagogies. That is the agency actually. Agency is about the learner, it is more focused on the learner, the learner must be an agent of change. That is where our approach is.</td>
<td>MCE CP group</td>
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But it is a difficult concept to grasp, but if you take it from the point of view that you are more focused on what is good or bad in the classroom, which must be centered about the learner. That is the agency.

And then the strong sustainability, it is more focused on the society, economy and the ecosystem. That they have to work together hand in hand and they are not separate entities. We have to follow that. Everything should be within what we have and what we can afford, we cannot get anything from outside the ecosystem. We have to live within the ecosystem.

These are the things that we have to be looking at as we are moving forward. I think that with our committee we don’t have a problem with the agency and strong sustainability.

| Identification of potential actors | “We are all affected by the climate change we cannot leave any person behind, irrespective of which subject someone is doing” but at the same time the change project team is only constructed of 4 different HODs | MCE CP group |
| Communication between principals and CP team | No mention/discussion about the Gaborones Guidelines on change project development | MCE CP group |
| Limitations of further implementation - Financial | Right now the subjects that have been engaged are the ones that belong to this committee. We haven’t yet engaged other subjects, but the only thing that was challenging as we didn’t have money to host a workshop, but we have told that we wanted to hold a Ws for the other department. All that we did was to inform other heads of departments about what the committee is doing but we wanted to make a presentation to them so that they can understand it in more details. | MCE CP group |
| Limitations of implementation - conceptual | Yes, the other thing is that mindsets change, because every time you come up with something that is not necessarily new, but maybe you are putting it in a slightly different tone, people say: we have too much to work, we don’t want to go there | MCE CP group |
| Seeking of Help | Role of administration | The administration should show support of the change project team as a way to make it easier for the cp team to seek help: I also think that support is good at different stages. You might get to a certain stage where you don’t need it, we are okay. And there are other stages when we might need it. Senior personal to help us solve a particular problem. So if they made a way of consider how serious this project, then the path will be made, it will be easier for us. They just need to be aware of what we are doing, so that when we get to that problem, and we need a particular kind of support, they should be in a position to see or to help us. | MCE CP group |
solve that particular problem. Because you cannot anticipate what problems we might have but along the way we are going to meet certain difficult problems and they should be there for us to reach that point.

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<tr>
<th><strong>Teaching practices</strong></th>
<th>No discussion seems to have occurred on the meaning that ESD have in terms of teaching practices.</th>
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<td><strong>In relation to SS and Agency?</strong></td>
<td>Maybe we are doing it unconsciously, like I said that we are interested about is equipping our students and then we are hoping that when they get to their classrooms they will be equipped to empower their learner as well. But now that he is introducing the word of agent of change, our learner are going to be the agents. That is why I think we are doing it unconsciously. But the sustainability aspect has always been at the back of our mind, that whatever it is that we are doing we have to ensure that in the end we are not harming the environment we are ensuring that to be able to keep it throughout even if when you are out of this earth, the other generation will be able to benefit from the resources that we have.</td>
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like I said, it depends on the topic at hand. Sometimes it gets straight away. Sometimes you need to verbally express it that is important because we expect you (the students) to want 1,2,3,4,5… when you get there. For example, in science there was a topic on ecology. In biology. One of the activities was that they had to look at different activities that they are doing, it’s some kind of a game, they look at what people are doing. They seek out, look at long traffic of cars with single driver in it. They see the use of power from fossil furs, from wind generated power, all those different activities that are happening around them. And then they have to grade it, and gave them points. If it is greening the economy, it gets positive points, if it is contributing negatively to the environment it gets negative points. And then in the end they are able to add them. After the game we expect them to bring it into the real life and want to help them make good decisions for them to get a bus to school or to cycle. Give themselves points. So they should be able now to do it in real life, and keep this marks at the back of their minds. It depends on the kind of topic that we are dealing with.

In the art department we haven’t done so much of knowledge sharing and lecturing, the pedagogies have been more unconscious. From thesis group we have started to see how we can go about different everyday tasks: from the economic point of view for example, if you asked a students to go buy a ball of clay, it will cost 20 pula. But we can also have student look for an ant hill and prepare their own bag of clay, it will be 10 times that size and it will be free! Those are the kind of things we are trying to learn them go about. Instead of buying, stuff like that.
| Capacity development | Ressource use | We have not exploited it that much because I think if you look at the manual itself, it almost resembles the parts and the whole. But you are right, we should disseminate and print more copies for the different departments | MCE CP group |

| TOC | Ownership & long term planning | At what point or stage can I be in a position to say “I am at the right check”. Do we have the card mastered to provide and give and that would say: if I have done one, two, three, then I know or I am nearer of these expectations. | MCE CP group |

Mr (2) was saying, how will we know that we have reached our goal? But it is difficult question. To me, I think that when we, the society, have made the ESD principal part of the culture, that is when we can say. When you can actually see with your eyes, just by walking around the street, these people are aware of what is going on. Then you can see that the message has been passed on. But when you still see us living our lives on like this, the whole day, when they are not used. I still have to drive to buy some vegetable… we still have a long way to go. When you can actually see that these people are aware of what is going on around them, in the society.
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<td><strong>Support system</strong></td>
<td>The Ministry of Education and Skills Development (MoESD) has a mandate to produce whole rounded globally competitive teachers and as thus, the curriculum designing for teacher education institutions has been undergoing review, one aspect of which was to try and address some global issues of which sustainable development is one of them. Although it has not been directly addressed as Education for Sustainable development (ESD), most courses in various subject areas have been identified as addressing most of the issues on ESD.</td>
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<td><strong>Provide help</strong></td>
<td>The MoESD through the Department of Teacher Training and Development (DTT&amp;D) and Basic Education support development of change projects through funding (availing funds for the running of the projects). Although DTT&amp;D was involved at a late stage in these projects, the Department of Basic Education has been working with some Primary Schools on various change projects. The MoESD also sponsor teachers and lecturers to attend workshops and conferences to share ideas of their change projects and ESD in general, although this is usually hampered by lack of funds to sponsor more people</td>
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<tr>
<td><strong>Consensus for change</strong></td>
<td>Discussing ESD in the teacher curricula is easy BUT the infusion and/or integration is not an easy thing. There is still some resistance despite the fact that teacher trainers see and understand the concept and the importance of issues on sustainable development. Well, some still feel this is not anything of urgency and thus can wait or rather it’s going to overload their programs and thus affect program delivery. This is to say although people understand ESD; there is still resistance for change by some which makes progress on the whole thing to be slowed down.</td>
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Education Officer at the Ministry
## Annexe 10: Recommendations

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<tr>
<th>Institution &amp; Change project</th>
<th>Strengths</th>
<th>Recommendations</th>
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| Serowe College of Education: “Rainwater collection and bore hole rehabilitation” | - Strong project with a long history within the college  
- Locally relevant and needed to reduce water bills | - There is great potential to bring this issue in the curriculum of the institution  
- There is some opportunity in developing project with an environmental education perspective  
- The initial collaboration with a local primary school would strengthen the project  
- Need to develop the long term vision of the project |
| Francistown college of Education: “Grey Water use: towards a sustainable environment” | - There is a strong ownership of the project on behalf of participants  
- High level of cooperation and voluntarism within the institution  
- ESD is incorporated in strategic documents | - The transformative nature of ESD should not be forgotten  
- There is a great potential to reorient the project towards enriching the curriculum |
| Tonota college of Education: “Management of Environmental outlook” | - Ability to identify limitation of institutional situation and adapt  
- Unity between students and college administration | - Assumption that understanding of ESD would cascade through teacher educators  
- Develop a stronger understanding of ESD |
| Molepolole College of Education: “Curriculum innovation and material development” | - Some understanding of ESD and SS and agency  
- Developed their own activities and exercises  
- Strong group unity | - Would benefit from including other Head of Departments  
- Make a deeper use of ESSA publication  
- Further develop in-class pedagogies |
<p>| Tlokweng College of | - Ability to bounce back | - Require a deeper understanding of ESD |</p>
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<th>Education: “Make a hotbox”</th>
<th>• Involvement of a wide variety of head of departments</th>
<th>• Assumption that information would trickle down</th>
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<td></td>
<td>• Develop ownership and team cohesion</td>
<td>• Increase communication between team members</td>
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<td>University of Botswana:</td>
<td>• Identified an opportunity to affect curriculum and work within administrative constraints</td>
<td>• Further develop institutional capacity to embed ESD</td>
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<td>“Mainstreaming ESD in</td>
<td>• Use of ESSA publication</td>
<td>• Sensitize other lecturers to ESD</td>
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<tr>
<td>curriculum of teacher</td>
<td>• Deep and strong understanding of ESD both in theoretical and practical terms</td>
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<td>trainers”</td>
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